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[OFFICIAL NOTICE.]

Wrinkle Department, Western Gas Association.

To the Members of the Western Gas Association—Gentlemen: The season is approaching for the collection of Wrinkles for the current year for presentation to the Western Gas Association at its coming meeting. All members and friends of the Association are reminded and invited to kindly forward, to the Wrinkle Editor as below, such ideas and devices as are suitable for this Department of the Association's work. F. H. SHELTON, No. 112 North Broad street, Philadelphia.

BRIEFLY TOLD.

MR. FABEN'S PAPER CONCERNING PESSIMISM AND OPTIMISM.—That the 17th annual meeting of the Ohio Gas Light Association was well worth attending is amply proven by the detailed report of its proceedings now appearing in the JOURNAL. In the chapters that we give this week of what was there done are the paper by Mr. Charles R. Faben, of Toledo, Ohio, and the discussion thereof. Both are interesting; one, in some respects, is amusing. The paper itself is right to the point, for it recites a plain statement of facts, as these occurred in the management of a gas company with which the author has been connected since 1868, and with which his clever and respected father had to do well prior to 1868. Its statements are to the effect that the policy which guided the Company long after 1868 was found to be ineffective long before to-day, and that revisions were put in force of the old policy which caused the new one to bring the Company to the place that it should occupy as a vital, moving force in the lighting and fuel supply of the city, which, on the whole, it has well served quite over a round half century. But what we are moved over is the fact that anyone, even in a district where natural gas is still commandable in fair volume, engaged honestly in the manufacture of gas, should have *any* thought of doubt as to the future of his trading. If increasing volume of sales means life, then artificial gas sellers are of the liveliest sort, for our own figures, respecting trade in manufactured gas for the months of December, 1900, and January and February, 1901, as compared with the corresponding periods of 1899 and 1900, show an average gain of 12.22 per cent. The percentage figures cover 42 separate places, and the test points were selected by our usual method. Going back to the paper and to the discussion on it, we have to say that Mr. Faben's "pessimism" was misinterpreted much by some who listened to the text. If we can read aright, Mr. Faben's story was a recital of truth, and it was further a recounting of what happened in Toledo in the lighting situation as that developed, always under his eyes and for many a day under his own control, as far as artificial gas is concerned. So it is all the greater mystery that in the debate some signs of pessimism cropped out. Let us say to the seeming pessimists that Mr. G. D. Roper struck the keynote in the discussion, only that we would ask our readers to refer also to the 16th Annual Report of the Board of Gas and Electric Light Commissioners, of Massachusetts, for proof as to whether one should be an optimist or a pessimist over the artificial gas trade. The figures given in the report, which concern the total quantity of gas sold by the "coal gas" companies of the State,

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for the twelvemonth ended June 30, 1900, as compared with the quantity put out for the year ended June 30, 1899, show these results: In the latter year, 17 companies reported losses in send out, from a minimum of .24 per cent. (total sales less than 2,000,000 per year), to a maximum of 20.78 per cent. (total sales, something over 7¼ millions). For the succeeding twelvemonth, 2 companies report losses: One of 4.90 per cent., on a sale of something over 1,000 millions cubic feet; the other 12 63 per cent. on a sale of virtually 5 millions. Meantime, h re are the increases for the periods under consideration: In 1899, 46 companies reported increases: Maximum, 28.10 per cent., and a sale of virtually 18 million cubic feet; minimum, 24 per cent. on a sale of 2 million cubic feet—these are, of course, the percentage extremes, and show about as poor results as possible for this argument. They show, however, the mean gain. In 1900 the returns show 60 companies reporting gains: Minimum, 55 per cent. on sales amounting to 11 millions; and 31.80 per cent. on sales reported at 2½ millions. Between the gain extremes are many varying percentage figures. For instance, 26 80 on an output of 170 millions; 25.40 on an output of 20 millions; 8 98 per cent. on on output of 135 millions; and so on. Take it all in all, we have to range ourselves with those who believe there is far more cause for optimistic than pessimistic thought in connection with the business of making and supplying gas; and we are sorely puzzled to understand why it is that some of the debaters on Mr. Faben's paper f iled to comprehend that the whole trend of his lines was for optimism as against its antonym.

NOTES.—Mr. David Henning died at his home in Battle Creek, Mich., the 1st inst. Deceased, who had made a fortune in the apple trade, had of late years been prominently identified with the gas business. At the time of his death he was President of the Battle Creek Gas Company, and had large interests in the Companies at Leavenworth, Kansas, and Springfield, Mo.——The vote in connection with the election in Clinton, Mo., to determine whether the gas and electric lighting franchises of the Clinton Company should be renewed for a period of 25 years, resulted as follows: For, 2,138; against, 793.——It was announced last Friday that the scheme to consolidate the gas and electric lighting supply of Montreal, Can., had been to all practical intent perfected. The succeeding Company is to be known as the Montreal Light, Heat and Power Company, with a capitalization of $17,000,000. Those in the merger are: The Montreal Gas Company, the Royal Electric Company and the Chambly Manufacturing Company.

Tact.

The *Metal Worker* says that in the conduct of a business of any kind there is one desideratum that is sometimes lost sight of, but which, nevertheless, is as necessary to smooth and successful operation as is the lubricant to the cylinder of an engine. The possession of tact, perhaps more than any other quality, makes a man successful in dealing with his fellows, while its absence is often the cause of failure. To some few persons tact comes naturally, just as some are born with a genuis for music; to most, it is a quality acquired and cultivated in the school of experience, as the musical art, to the majority, is acquired by study and practice. Tact, too, is an art that well repays study. The right kind of tact does not involve any softening of the moral back bone, still less does it spell dissimulation. Rather is it a due recognition of the rights of others; an acquired ability to view things from standpoints other than one's own. It is a readiness to go more than half way to meet and placate an opponent in a controversy, where, of course, it can be done without sacrifice of self-respect or principle. It involves the exercise of patience and self-restraint. In short, tact is an evidence of the respect and good will for others which should be a part of the make up of a gentleman, using that word in its best sense. At the same time the absence of this quality does not necessarily mean a lack of k ndliness or good intention, for we all know some good, honest pers ons who are wofully devoid of tact. That is their misfortune, in most cases not their fault, just as some men—to hark back to the musical simile—are born without a note of music in their composition and, to save their souls, can never distinguish between "Yankee Doodle" and "Old Hundred." In both cases, however, they are the exceptions. Tact is an art that can be acquired by almost anyone and it is an accomplishment that is especially well worth acquiring by business men. It smooths over misunderstandings and dissolves possible antagonisms. It makes customers and friends and keeps them. In fact tact, while its value is not possible of computation in dollars and cents, is a very real and a very important business asset.

[Continued from Page 686.]

PROCEEDINGS, SEVENTEENTH ANNUAL MEETING, OHIO GAS LIGHT ASSOCIATION.

HELD IN DAYTON, O., MARCH 20 AND 21, 1901.

FIRST DAY, MARCH 20—MORNING SESSION.

Discussion on the Paper[1] by Mr. E. E. Eysenbach on a Gas Pumping Station.

The President—Gentlemen, having listened to this very interesting paper, I hope you will all feel free to express yourselves on the subject, remembering that one of the most beneficial features of our annual gatherings is the full and extended interchange of opinions by the members present. I will ask Mr. James T. Lynn to open the discussion.

Mr. J. T. Lynn—I do not know that I can say anything of interest on this subject. I have had some experience in pumping gas, but only with steam, using natural gas under the boiler, and employing a steam pump manufactured by the Standard Oil Company, at Oil City, Pa. I would like to ask if this cylinder takes gas at both ends, and how often it takes it during a stroke?

Mr. Eysenbach—It takes it at both ends, and twice during a revolu tion.

Mr. Lynn—Using it ordinarily, would it naturally take gas twice a stroke; or would it take gas just when necessary, as in our old gas engines?

Mr. Eysenbach—Do you mean at the compression or the engine side?

Mr. Lynn—The engine side.

Mr. Eysenbach—No. It takes a little gas, just as needed.

Mr. E. F. Lloyd—From the description of the engine it seems to operate much on the principle of the Westinghouse, of throttling the mixture and losing the compression, thus getting a lower compression on a lighter load. That principle I believe is being carried out to a considerable extent by the Westinghouse people, but it does not seem to be favored so much abroad, where they are using large engines, from 750 to 1,000-horse power, on blast furnace gases. They are using abroad the horizontal instead of the vertical type, which I presume this is. Has there been any difficulty observed in taking a compressed, explosive mixture and passing it through the admission valve, through the explosion cylinder? In case of back firing, it seems to me it would cause trouble.

Mr. Eysenbach—No; I do not think the flame propagation is ra,id enough to back fire. We have had no such trouble whatever.

Mr. Lloyd—Is the mixing cylinder under pressure?

Mr. Eysenbach—It is under 70 pounds pressure.

Mr. Lloyd—Then the engine compresses in the cylinder itself 70 pounds up to the firing point?

Mr. Eysenbach—Yes.

Mr. Lloyd—What is the compression used in firing this cylinder?

Mr. Eysenbach—100 pounds; that is sufficient to start it.

Mr. Lloyd—I mean in running the engine; in its regular operation?

Mr. Eysenbach—100 pounds.

Mr. Lloyd—And you have no difficulty through that valve at all.

Mr. Eysenbach—No.

Mr. Lloyd—An engine introduced some years ago carried a supp'ementary pump, which brought up the pressure in somewhat similar manner, but they found considerable difficulty was experienced with that. In case any leakage through the valve occurred the storage tank would itself explode.

Mr. Eysenbach—We have not had any trouble yet.

Mr. J. Franklin, in response to a call from the President, said: Gentlemen, I do not believe I can add anything more to what has been already said in regard to the engine. We have about 150 engines in operation in Cincinnati, the largest of which is supplying two dynamos. They are built on the Westinghouse principle, and are working very satisfactorily.

Mr. J. T. Lynn—At what pressure does the gas go into the mixing chamber?

Mr. Eysenbach—One ounce.

Mr. Lynn—And now you think you are using 15 feet per actual horse power?

Mr. Eysenbach—Yes. We have not taken any tests as yet.

Mr. Lynn—The Westinghouse people are doing a little better than that in Detroit. They are there running a number of gas engines for

1. Ante, p. 485.

electric lighting, direct connected, and are developing 1-horse power per 11 feet of natural gas. They will guarantee to furnish 1-horse power per 15 feet of artificial coal gas.

Mr. Hayward—What size engine?

Mr. Lynn—Anything over 50 horse power. I am figuring with them now for a 450 horse power engine.

The President—I believe Mr. Holmes is somewhat familiar with the Westinghouse engine. We would be pleased to hear from him.

Mr. Holmes—Possibly I have some familiarity with that engine, but not being connected with that department I prefer not to say anything about it. I believe one of your members is connected with Westinghouse, Church, Kerr & Co., and possibly is here. I might say though that I think the gentleman from Columbus will have no trouble getting down to a little less than 10 feet per hour per horse power, if he uses a Westinghouse engine.

Mr. Eysenbach—We propose to make a complete set of tests during the month of April. The manufacturers of the engine are to be on hand, and the Professor of Mechanical Engineering at the State University is to take charge of the work. When I started to write the paper I thought we would have the tests before it was completed. However, we have been unable to make them. The designer of the engine does not doubt for a moment that we will be able to get a delivered horse power per hour on 10 feet, which would be very cheap power.

Mr. C. A. Schwarm—I would like to ask the water consumption used in cooling? Have you made any tests along this line?

Mr. Eysencach—No. We run our temperature about 100°.

Mr. Schwarm—How do you take care of the exhaust?

Mr. Eysenbach—Through two 12-inch pipes.

Mr. Schwarm—Does it make much noise?

Mr. Eysenbach—Not so very much.

Mr. Schwarm—Do you need mufflers on the pipes at all?

Mr. Eysenbach—No; for there are no houses within a half mile.

Mr. Lloyd—Regarding mufflers on gas engines, I would like to say for the general information of those troubled on such problem, that there is no difficulty whatever in absolutely silencing the exhaust from any size of engine. We are running 3 engines in our shops in Fort Wayne, and have experienced no difficulty whatever in silencing the exhaust. Take a horizontal cylinder for a 25-horse power engine, about 2 feet in diameter and 12 feet long, fill it half full of water, bury it underground, let the overflow from the engine run through it, turn the exhaust in on top and take the exhaust pipe out the other end and you will have no difficulty with noise from your exhaust.

Mr. Andrews—Regarding muffling the exhaust, I find, in using a 150 horse power Westinghouse engine, that by running a part of the cooling water into the exhaust pipe the noise can be practically overcome. It will form a steam vapor which will very effectually muffle the exhaust. It is a very simple way of taking care of it, and at the same time the water is carried off in the form of vapor or steam.

The President—Is there or not a reduction in the volume of gas which escapes owing to this drop in temperature? Is it not possible the evaporation of the water decreases the volume of gas you are discharging at the same time?

Mr. Andrews.—I think so. As the water vaporizes, it reduces the temperature of the exhaust and destroys the sharp report. As to the consumption of water in these engines, I will say we are using a circulating pump which takes water from the bottom of the holder, discharging it back at the surface. We keep that up the year round. This keeps the water in the holder warm enough in winter weather to prevent freezing, and in the summer there is enough cool water at the bottom to keep the engine cool. It makes a very simple and efficient way of handling it. We have very bad water. The percentage of lime and magnesia is very high, and we have found it necessary to dissolve the scale with a little hydrochloric or muriatic acid, letting it stand in the cooling water space for a few hours. This we find works very effectually in removing the sediment.

The President—We would like to hear from some of the other members on this subject.

Mr. Lloyd—I do not want to monopolize this discussion, but in regard to the quantity of water necessary when using the tank for cooling, you will find about 25 or 30 gallons capacity in the standing tank per horse power engine will furnish a sufficiently low temperature for circulation.

The President—I presume the President can ask a few questions. Mr. Eysenbach, do you have any difficulty in starting the engine? How do you get rid of the load? How do you take care of the load in starting it?

Mr. Eysenbach—Do you mean to get up speed in the first instance?

Mr. Whysall—Yes.

Mr. Eysenbach—We have but very little pressure to start with.

The President—What I was getting at was this. Your engine is at rest and you have a high initial pressure on your pump. If the inlet and outlet pressure is the same for the first few revolutions, you have a very heavy load to move, do you not?

Mr. Eysenbach—No.

The President—Do you start off with the pump ends empty, or do you have a system of by-passes?

Mr. Eysenbach—We have a system of by-passes which allow us to get up speed.

The President—Then the engine is started with no load to speak of.

Mr. Eysenbach—Yes, sir.

The President—That is what I wanted to get at.

On motion of Mr. McIlhenny a vote of thanks was tendered to Mr. Eysenbach for his valuable paper.

The President introduced Mr. C. W. Andrews, of Hamilton, O., who read the following paper entitled

MORE ABOUT CONCRETE TANKS.

The writer had the pleasure of presenting, at the fifteenth annual meeting of this Association, a few notes[1] on the construction of a concrete gasholder tank. Since that time Mr. D. McDonald, of Louisville, Ky, has constructed a much larger tank, and I have also had the opportunity of building a second one. It, therefore, was suggested by your Secretary that I give you the results obtained in this later work. Before doing so, however, I wish to say that the concrete tank built in 1897 gives practically no leakage and shows no signs of deterioration, and probably will not do so, as Portland cement concrete becomes harder with age, especially under water, while many brick, if not vitrified, will materially soften after several years of immersion.

The holder built by Mr. McDonald has proven sccessful, although built with Louisville cement, which construction I do not advocate, nor do I think that Mr. McDonald would repeat his use of the same, as the difference in the results obtained, especially in view of the rapidly increasing manufacture of domestic Portland cement, with its consequent reduction in price, more than compensates for the additional cost.

We followed our previous practice in using clean gravel, although it is not necessary in this case to wash it. The tank was somewhat deeper, it being 25 feet deep in the clear by 53 feet inside diameter, extending 10 feet above the surrounding grade. The ground will be banked up about 5 feet, thus leaving approximately 5 feet exposed; this was necessary on account of the water level being only 19 feet below the grade level. The walls were made somewhat heavier than would have been the case had the whole tank been below the ground, they being 30 inches thick at the bottom and 23 inches at the top.

An entirely different construction was used for the forms. The inside form was built of 14-foot vertical dressed boards, nailed to 4 concentric rings, which were built up of two thicknesses of inch boards, sawed to the circle. The outside form was constructed in a similar manner, thus forming two concentric cylinders, separated by the required thickness of the walls, and 14 feet high. The cast iron sockets for fastening the wall plates were bolted to the boards in their exact location, this doing away with any trouble in regard to their alignment. Mixing boards 12 feet square were arranged around the excavation, their inner ends supported on the outer form and their outer ends on the banks. These boards were connected by wheeling runs, so that the wheelers could make continuous trips to and from the gravel pile without interference; from this it will be noted that the concrete was shoveled directly from the boards into the form instead of being wheeled. This was found to be a decided saving, as much larger loads of gravel than of concrete were wheeled, and loss of cement by spilling was prevented.

After the walls were raised up 13 feet, the forms were cut into sections about 20 feet long, and raised vertically by a light derrick. They were then supported and braced from below with a 2 by 4 studding. This process was repeated until the two forms were raised to their new positions. The forms were then accurately centered, and the mixing boards raised on trestles.

A substantial run, connecting the boards with each other, and with an inclined run extending to the gravel pile, was then constructed. By this arrangement no difficulty was experienced in handling the materials expeditiously.

It is desirable to reduce the height of the inner cone, as the strains

1. JOURNAL, March 27, 1899, p. 445.

in the concrete bottom, due to the varying pressures and settlements, are very great, and in many cases result in cracking around the top of the cone as well as at the bottom of the wall.

In conclusion, I desire to note a suggestion which our friend, Mr. McDonald, made in regard to the separation of the concrete surrounding the inlet and outlet pipes from the tank proper. As will readily be seen, when the tank settles, as is usually the case, the pipes form a girder tending to uphold that portion of the wall directly above them; this is, of course, impossible, and often results in cracked inlet or outlet pipes. He suggested that a layer of sand, say 6 inches thick, be interposed between the two masses, thus doing away with any direct contact.

Discussion.

The President—Gentlemen, I hope we will have a very prompt and energetic discussion on this paper.

Mr. Schwarm—Does Mr. Andrews know the comparative cost between this form of construction and the steel tank?

Mr. Andrews—I have not taken that condition up at this time, because steel is much higher than it was in 1897. At that time I figured it out there was a decided saving in favor of this method. I would say, however, that conditions would very materially govern the cost. For instance, if gravel or broken stone is difficult to obtain, and cement is high in price, the difference might be reduced to a very small figure.

Mr. Schwarm—Do you know about the percentage of saving?

Mr. Andrews—In 1897 I think the saving was in the neighborhood of 20 per cent.

The President—Mr. Chollar, we have not heard anything from you this morning. I believe you know something about this.

Mr. B. E. Chollar—I never had any experience with concrete work of this kind, so I am unable to say anything thereon which would be of benefit to the members. I have built concrete foundations, but no tanks.

Gen. Harbison—I would like to ask Mr. Andrews if he experienced any difficulty at all in the cracking of the tank wall caused by lack of uniformity in the foundation?

Mr. Andrews.—In our old tank we have not yet experienced any difficulty in the way of cracking of any moment. The only cracks I found appeared in the coating which is put on top for the finishing coat. That cracking was probably 1 inch in depth, but the walls have shown no sign of cracking whatever. It has been in use 3 years, and the leakage has decreased to practically nothing, so that I judge no further cracking has taken place below.

Gen. Harbison.—I apprehend, Mr. President, that generally in the location of gas works in the cities it may be found that there is an irregularity in the condition of the soil at the bottom of the tank and that danger may be encountered from the cracking of the concrete walls. In Hartford we have had varied experiences of that nature. In 1849 we commenced building our first tank, 60 feet in diameter and 20 feet in depth, and the contractor was able to make it tight. It was built of brick laid in Portland cement, but the nature of the soil in the vicinity was of such a variety that the tanks built afterwards were not as successful in respect to being tight. Perhaps that was because the parties who built the original tank had experience, whereas the youth who came in to take care of the work a little later, not having as much experience, did not know how to have the work done. One of our tanks was built by a contractor from Philadelphia who was highly recommended to us, but the day it was filled with water it split from top to bottom, leaving a space 12 feet between the tank and retaining walls, fronting on the river. It cost us about $1,500 to dig out that 12 feet of space and fill it with concrete to make it tight. It held for a few years, then it would open up after every freshet. We have only a rise and fall of 27 feet in our levels from low to high water. We are not so favorably situated as our friends in Cincinnati, who can look for a rise and fall of 60 or 70 feet without any trouble, but our variation of 27 feet is sufficient for all practical uses so far as we are concerned (laughter). In repairing these tanks it has been the problem how to stop the leaks, and the one I just told you about, which leak occurred immediately after it was built, was relined with a 4 inch brick wall, chipping off the entire surface of the old brick so that the cement would adhere. The 4 inch wall was anchored into the old work and we succeeded in making a perfectly tight job of it. It was not built after the plan of architecture of my friend Persons (laughter), but we succeeded in making a good, compact job of it in this way. Since that we have steel-lined 2 tanks that we built of brick and that could not otherwise be made tight. Five or six years ago we built a steel tank 30 feet in depth and 100 feet in diameter, and I am glad to be able to say that it was a perfectly tight job. All the water that comes from it I think is simply through evaporation. It is 20 feet below the ground level and 10 feet above. It costs a trifle more. However, taking Mr. Andrews figures that it costs 20 per cent. more—I presume he knows and I don't—I would be willing to pay the 20 per cent. additional in order to have a steel tank which I know is perfectly tight rather than to have a concrete or brick tank liable to go to pieces later on. A leaky tank is a difficult problem for a gas man to overcome.

The President called upon John R. Lynn, Portsmouth, O.

Mr. J. R. Lynn—I have had no experience in the building of concrete tanks, but should judge that the nature of the soil would have very much to do with whether or not a tank should or could be made tight. I just removed a holder a short time ago that rested in a concrete tank I should judge for 38 or 40 years, and the tank was still perfectly tight. The soil around the tank was rather moist, but we could detect no seepage at all.

The President—Mr. Light, could you give us some information about concrete tanks?

Mr. Joseph Light—I have had no experience with concrete tanks. If I had a tank to build, I believe I would prefer to build it of brick or steel, even if it in fact did cost a little more.

The Chair then called on Mr. G. N. Clapp.

Mr. Clapp—I have had no experience with concrete tanks, but always believe in being on the safe side. I built a small tank last spring, and it was perfectly tight. We noticed no shrinkage except that from evaporation. I am now contemplating building another tank. I am very much interested to know the experience of the different members with reference to concrete, but would like to know the difference in cost, if Mr. Andrews could tell us, between brick and concrete tanks.

Mr. Andrews—I have always believed there were certain locations where a steel tank was preferable beyond all question to any other kind. What I have contended for is that concrete is preferable to brick especially, not necessarily so much as compared to the steel tank. As far as I could figure out the saving in the concrete tank, as compared with a brick tank, is fully 50 per cent., provided you get your gravel or broken stone at a reasonable figure. As to the steel tank, the conditions are such that the cost is a very close approximation under certain circumstances. Where the foundation is not as satisfactory as you might desire, there is certainly no reason why the steel tank should not be used. I prefer it myself to the concrete tank, provided you cannot get good foundations. I have always felt, where the foundations were always satisfactory, you are more safe if you have your tank down in the ground. Then there is no further deterioration or expense about it after you once get it tight; whereas the steel tank has to be painted and a certain amount of work expended upon it in that way. As between brick and concrete, there is no question that a very large saving can be made by constructing a concrete tank.

Mr. E. C. Baker—I am not a member of the Association, but I am interested in the cement question and have had some experience in Portland cement. I would like to say just a few words in regard to Portland cement holders. The government, in its public works in a great many instances, has done away with dimension stone for bridges, bridge piers, dams and abutments, and is now using Portland cement concrete. It makes a more solid, stronger and more durable job. Instead, however, of going down to bed rock, in many instances they drive piles, which I suppose could be done in the case of gasholders. As far as cracking is concerned, Portland cement concrete is a great deal stronger than brick construction, if mixed in proper proportions. It would not be so liable to crack, and is much better than brick or stone. It is more durable and not so liable to leak. Portland cement concrete would not crack, where brick or Louisville cement concrete would crack. It costs much less to build with concrete than with brick or steel or stone. Of course it depends somewhat on the cost of gravel. I was reading an article last night with reference to the construction of an immense government dam at a lake near the head of the Mississippi river. They had been working at it for over two years, using Portland cement concrete. There they washed every particle of gravel and got clean sand. Unless you have clean gravel and sand you have to have a larger proportion of cement. The general proportion which the government uses is 6 parts of crushed stone, 3 of sand and 1 of cement. The stone and gravel should be thoroughly washed, and both the stone and sand should be very sharp and very free from loam.

Mr. Lloyd—I would like to ask Mr. Baker the size of mesh to which that stone was broken in the government work.

Mr. Baker—The stone used in concrete work should not be larger than would pass a 1-inch ring. In every cubic yard of concrete, they

lay 8 boulders or "nigger heads," but of course that could not be done in the use of concrete for tanks; the wall would not be thick enough. The boulders in these larger works are laid carefully in the center so that they would not be exposed.

The President—This is a very interesting paper, and the discussion has certainly brought out a number of valuable points, but we would like to hear further from the members.

Mr. Clapp—Mr. Andrews, did you make any preparation for the foundation around the walls by tamping, etc. I believe you have gravel for your foundations?

Mr. Andrews—In excavating we were very careful not to disturb the gravel below the actual grade of the concrete. That is, no backfilling whatever. As we had a good bed of gravel for foundation, we took no further precautions in the way of tamping, but should there have been any excavating below that we certainly would have done so.

Mr. J. T. Lynn—I would like to ask Mr. Andrews how much footing he put in below his wall or ring.

Mr. Andrews—In our new holder we extended the footing course about 1½ feet beyond the outside of the wall and into the foot of the cone. This block was put in about 12 or 14 inches thick, and allowed to harden before the side walls were started. This made a very wide footing course.

On motion of the Secretary a vote of thanks to Mr. Andrews for his paper was adopted.

The President—Mr. Somerville, we would like to have a few remarks from you. You are a little late coming in, but at the same time I know the members would like to hear from you.

Mr. J. Somerville—It is very kind of you, Mr. President, I thank you for the courtesy extended. It gives me great pleasure to be here, and I am sure I will reap much profit and enjoyment from these proceedings. It is the first time that I have had the pleasure of coming to an Ohio meeting. I have always understood that it is, and indeed it has a reputation of being called, a working Association. In other words I have been informed that the President, when he calls upon a member who has nothing to say, is in the habit of ringing the bell on him, which I think is a very good plan. I have nothing further to say at this time, except to express my gratification in seeing the faces of so many friends whom I have met at the meetings of the Western Association, and to add that I will be very glad to listen to your very valuable papers and interesting discussions. I thank you. (Applause.)

A Dip into the Question Box.

The President—I think we might dispose of Question 5 in this connection.

> Question No. 5. "What is the best way to stop a leak in the bottom head of a steel holder tank, 50 feet in diameter, location of leak unknown, stream of water coming out through foundation of 2 inch pipe size. Holder rests on rock foundation, with 2 inches of sand bedding?"

Mr. Eysenbach—Is this a case of supposition, or did it really happen?

Mr. Persons—I think Mr. F. D. Moses will be here this evening. He had experience with something of this sort at St. Paul, Minn., a few years ago. I would not undertake to state how he succeeded in stopping the leak, but he did it. If he comes in this evening I am sure he will be able to furnish a complete answer to the question.

Mr. J. R. Lynn—I think if a man has that kind of a leak, about the first thing he better do would be to find out just where it was.

Gen. Harbison—Our steel tank has not a bottom head. It has a bottom of concrete, and I will advise a man who has a leaking head in the bottom of his tank to remove the water, put on 4 or 5 inches in depth of good concrete, spread over the bottom of the tank, to stop the leak. I want to say one word regarding the cost of keeping a steel tank in repair. For the last 6 or 7 years we have been making water gas as a large portion of our whole volume of output. As we all know the tar from water gas is very much thinner than that from coal gas, and a laborer with a whitewash brush will cover a large amount of surface as paint with water gas tar. They who tried it, I think, will agree with me that there is nothing else as cheap and serviceable. We paint our tank above ground, and also our holders, with water gas tar. We paint the walls of all the buildings, probably 2 or 3 feet above ground, with water gas tar, and the stone walls around the two sides of the works, up to 2 or 3 feet above the surface, were painted on the inside with the same material, the balance of the stone walls being white washed. We do not do this oftener than once in three years, and where any of the walls are bricked above the surface of the ground, on account of the surface having been raised, so as to get out of the water since the buildings were erected, we have dug down 6 inches below the surface of the ground a foot wide, and saturated the brickwork with coal tar, and for 3 inches above the surface of the ground, which prevents any moisture from working into the wall. In this way it does not cost any money, practically speaking, to protect the buildings. I have brought a section with me which I will be pleased to exhibit, and I hope some member will interrogate me with reference to it if it is not sufficiently self-explanatory. While I am on my feet, another matter I would like to allude to, and then I will be seen, perhaps, and not heard the rest of the day. Recently my attention was called to the making of roadbeds, and as we have a large amount of asphalt in our streets now (for a city of our size) which is not working well, some of us have been advocating the old macadam style of roadway properly put down. It has recently come to my attention that, in Hamilton, Ont., they put down miles of macadam, the stone being mixed with coal tar, and as a market for coal tar is desirable for the gas industry, especially to those making coal gas, this presents a very significant question for investigation and is liable to work out good results for us. If we can show our people that the preparation of macadam mixed with coal tar is the most serviceable, and in the end the most economical, material with which they can make our roads, then we have done good work for our citizens and our companies. It is worth investigation, I think. I started our Street Commissioners on a line of investigation in that direction, and I think it may work out good results, so that we will be able to sell our coal tar for what it is really worth and do the city a good turn besides.

The President—We will now take Question No. 3.

> Question No. 3. "How many K.W. can one obtain from 1,000 feet of gas in a gas engine; (a) at full power; (b) at ¾ power; (c) at ½ power; (d) at ¼ power?"

Mr. Andrews—I was just making some figures here in connection with that matter. The first point I would call attention to is what kind of gas is meant? It is rather difficult to answer the question intelligently, for no information is given as to the quality of gas; whether a gas of 600 or of 1,000 heat units is to be used. I would say that, using ordinary illuminating gas, you would obtain at full load approximately 30 K.W. to 1,000 feet of gas. The quantity obtained at ¾, ½ and ¼ power would be determined entirely by the efficiency of the engine or generator under these conditions.

The President—Question No 6 is:

> "What is the thermal value of acetylene gas ($C_2 H_2$)?"

Mr. Eysenbach—Does that mean 1 pound or 1 foot? It is about 1,400 heat units per foot.

The President—Question No. 7 is:

> "What is the average mean, horizontal candle power of a flat flame burner on 20-candle power gas under ordinary conditions such as exist with consumers?"

I will call on Mr. Beardsley, of Cleveland, to reply.

Mr. Beardsley—That is something I do not know a great deal about. I would rather be excused.

Mr. Chollar was called on by the Chair.

Mr. Chollar—I will have to give that up, too.

Mr. J. R. Lynn—I view the question in about the same light as the gentlemen who preceded me. The flat flame burners are of such variety that the results are necessarily very widely different. I do not think there is any way at which you could get an average.

Mr. Chollar—Making a guess at it, I would say about 10 candles as an average.

Mr. Lynn—Is that on a consumption of about 5 feet per hour?

Mr. Chollar—Yes; somewhere in that neighborhood, I think.

The President—Question No. 8 is:

> "Has any progress been recently made towards successfully reburning spent lime?"

Mr. Chollar, can you answer that question?

Mr. Chollar—I have known of some places where they have done so, but that was years ago out in St. Louis, Mo., where their lime was used over and over again, but I have not been able to see any reason why one should do it when you can get the limestone almost for nothing. Why need do that when the new limestone can be obtained so cheap? I have never known it to be done at a profit, although possibly it might have been done where limestone was not readily obtained.

Gen. Harbison—Does any member from his experience know what it costs to burn lime over again per bushel? For instance, if a party

were using oyster shell lime, would it pay him to reburn it if lime was worth 10 or 12 cents per bushel?

Mr. Chollar—I cannot answer that question with any degree of precision. I think where I have seen it done, it had been done on account of the scarcity of limestone; the lime had to be hauled a long distance and no limestone near the point could be obtained cheap enough. I think it has been in such instances that attempts have been made to reburn spent lime.

The President—Question No. 10 is:

"In concentrating ammoniacal liquor, would it be advisable to use the cream of lime to liberate the fixed ammonia, and what per cent. increase in yield NH_3 would be obtained? Where and how should it be admitted to the concentrating column of the Stroh and Osius type?"

I will call on Mr. Leakey.

Mr. N. G. Leakey—I have very little information on that subject. Concontrating the liquor, it will be all right to use the lime in a large works, but in a small works I would not advise it. The percentage of ammonia there obtained would depend altogether on the amount of fixed ammonia.

Mr. Eysenbach—I would like to say in tests I have made, the fixed ammonia runs so low as a rule that it would not do in a small works. We use lime and the fixed ammonia runs about ¼ to ½ of 1 per cent.

The President—Another part of the question which has not been answered is, "Where and how should it be admitted to the concentrating column of the Stroh and Osius type?" Mr. Leakey, I will call call on you to answer that question.

Mr. Leakey—I may say that that also differs with different sizes of concentrators. Some of them are not built for the use of lime, but in the large concentrators the lime is admitted through a perforated pipe in the top square section of the apparatus; that is in the Stroh and Osius type. As to other makes, I can't answer. As I said before in different sized concentrators the use of lime would vary. In a small works, carbonizing less than 7,000 tons, it would hardly pay to use lime.

The President—Question No. 11 is:

"What causes the heavy black deposit found in house and service pipes?"

Mr. Eysenbach—As I asked that question I think I had better describe the deposit which I found, for I would like to know if anyone else found anything similar. I wrote Mr. Chollar about it last spring, and found he had some trouble of a like kind. This is a peculiar black deposit. On analyzing it I found it to contain from 50 to 60 per cent. of iron oxide. In examining the pipes where we get these deposits, they appear perfectly smooth and clear, so that I do not believe it is rust; yet I cannot account for it in any other way. From what I know of iron carbonyl, it does not deposit iron unless it is heated to a certain temperature, and yet it strikes me that it comes from the purifiers in some way. I think iron carbonyl has something to do with it.

Mr. John R. Lynn—Was that coal gas, and were the pipes old or new?

Mr. Eysenbach—Coal gas, and the pipes were comparatively new; not over 5 years old.

Mr. Lynn—If the pipes were new, the deposit might have been from scale contained in them when they were placed.

Mr. Maxon—We found the same thing in our house piping, and while I do not know what caused it I noticed that it was always in a particular location—that is, at the foot of the riser. If an elbow is at that point it accumulates there. I do not know whether that would be from dropping from the pipe above, or what would be the cause of it, but that is the point at which the accumulation was found, and nowhere else in the house piping.

The President—As the noon hour has now arrived, the Chair will entertain a motion to adjourn. However, before that motion is made, I desire to state that the Committee on Entertainment has arranged with the proprietors of the Beckel House to defer the evening meal until 7 o'clock for the gas men. At that time at least a part of the dining rooms will be set aside for our own use and they propose to give us something extra. They did not state what it was to be, and I will not undertake to tell you. The members who are stopping at the other hotels had better register at the Beckel for the evening meal, in order to avail themselves of the hospitality of the local committee. To-morrow noon when we adjourn we are to go to the gas works and have luncheon with Mr. Light and the other members of the local Company. Before we adjourn, I desire to suggest to all the members the necessity of meeting promptly at 2 o'clock so that we can make progress with our work. We have a long programme and must utilize our time to the best advantage. When we get through with our work here, then we may have some time to see the interesting sights which are well worth our inspection in the City of Dayton. The National Cash Register Company has extended a cordial invitation to us to come out in a body and go through its plant. The Company certainly has a wonderful plant and a fine organization. It will be well worth the time required. Unless we are very diligent, however, we will not have any time to spare.

Mr. Leakey—In reference to Question 10, if the gentleman who asked it will call on me at the hotel I will be pleased to give him all the information I can.

Mr. Persons—I would like to suggest that Mr. Leakey give the explanation in regard to his concentrators here in the convention, as we would all be glad to listen to it. We do not all of us wish to keep his time fully occupied in separate interviews, so that the explanation if it could be made public would certainly be of benefit to the gas fraternity. If the gentleman who asked the question will bring it up during the afternoon session I would like to hear the explanation, and think it should be made at the meeting of the convention, so that we could all secure the benefit to be derived from it.

The President—If the gentleman who asked that question is present, I would like to know it, otherwise we will defer it until the afternoon session.

Mr. Leakey—I do not know exactly what is wanted, Mr. President. I might say that at small gas works, probably ranging as high in carbonizing as from 5,000 to 7,000 tons of coal per annum, it would not be advisable to use lime, but in a gas works larger than that it might pay. For small works we make an apparatus that has no attachment. We make a number of different sizes, so that the answer would differ in respect to the size of the works to which it relates. If anyone desires to ask any questions I shall be pleased to answer them. As it is I do not know exactly what is desired.

On motion, the Association then adjourned until 2 P.M.

FIRST DAY, AFTERNOON SESSION.

The Convention was called to order pursuant to adjournment.

The President—The next order of business is the paper by Mr. Charles R. Faben, Jr, of Toledo. I regret to say that because of illness Mr. Faben is unable to be with us, and Mr. Fred. Persons has very kindly consented to read the paper.

Mr. Persons then read as follows the paper entitled:

SOME OBSERVATIONS: PESSIMISTIC AND OTHERWISE.

The proper committee of the Ohio Gas Light Association have assigned to me the duty of presenting some thoughts anent the subject of the existing state, and future prospects of the gas industry. They further indicated to me that certain pessimistically inclined members of the Association were disposed to forecast rather an unpromising horoscope for the future of the gas business generally.

In view of the fact that I am without figures and other reliable data to sustain any fixed position in the premises, or to enable me to make comparisons between different managements in different situations, I must, therefore, rely entirely upon my personal experiences and observations of travel for guidance, and the statements that are to follow, must be very general in their character; in fact, mere glittering generalties.

The "Century Dictionary" defines "Pessimism" as the doctrine which teaches that the world is the worst possible. The tendency to exaggerate in thought the evils of life, or to look only upon the dark side; a melancholy or depressing spirit or view of life. The pessimist, therefore, is one who accepts the metaphysical doctrine of pessimism.

The same authority defines "Optimism" as being the metaphysical doctrine of "Leibnitz," that the existing universe is the best of all possible universes. The belief, or disposition to believe, that whatever exists is right and good, in some inscrutable way, in spite of all observations to the contrary. The optimist, therefore, is one who believes in the metaphysical doctrine of optimism. Pessimism is the invert of optimism, as all of us well know.

The pessimist, in a spirit and mind filled with alarm, the same in degree bordering on desperation, makes a loud cry, and seeming at the same time to gather some measure of comfort from the feeling and thought that possess him at the moment, makes such a declaration as this: "How dark and dreary this old world is! The future presents no ray of hope. Everything is out of tune. Nature itself is wrongly ordered, for as it now exists we experience only a few hours of bright

sunshine in each day, yet the same is encompassed between two long, dark, dreary nights."

The optimist, in turn, while regarding the same scene and situation, views such a different picture. To him, filled as he is with bright thoughts of the present, and also charged to overflowing with bright visions of the good things that the future holds in store for him, and with face radiant, eyes bright, he, with equally loud voice, vigorous in tone, yet tinged with the seriousness that conviction always brings, exultantly exclaims: "How good and beautiful this world and life is! Two bright, glorious days in quick succession, with only one short interval of night season between."

These two extremes, yet in various shades and degrees, represent all the types of human mind and fancy as we meet them in our daily lives.

Laurence Sterne tersely stated his mind on pessimism when he wrote these words: "I pity the man who can travel from Dan to Beersheba, and cry, 'Tis all barren.'"

It matters not whether we consider persons who are the producer or consumer, the buyer or seller, they are sure to make the impress of their mind and feeling manifest in the very atmosphere of their presence, and in degree, quite in accordance with the strength of character, personality, magnetic influence, or by any other term you may choose to use to define the power or influence they may possess to control the judgment of others.

The main thought expressed in the foregoing may not appeal at first, as being apropos, or capable of wide application by such a gathering of persons as here assembled.

Other thoughts and subjects of a more practical nature, in particular, those which possess properties of a physical nature, would seem to be more fitting for consideration and discussion by such a gathering, yet you will pardon me if I make a suggestion here and now, *i. e.:* That each one of us examine ourselves carefully, and fully satisfy ourselves as to which of the foregoing defined doctrines do we most strictly adhere, and in which school of thinkers are we best fitted to occupy a place or hold a position.

With this question fully determined and established, it will not be difficult to quite as clearly determine the measure and degree of genuine success that may have attended the efforts of each one, in his particular field of usefulness.

The foregoing statements are very general in character, yet they are susceptible of being applied with much force in the conduct of the business of which we, now in annual session, claim to be representatives. Among our members are enrolled a full variety of the useful persons necessary to the successful operation of gas properties. The list comprehends the entire category of useful factors to the industry, from that of presidents of gas companies, on down through the entire list, to that of good, handy workmen generally employed about the works of the various gas companies here represented. Yet it is to the managers and general management of these various corporations that I particularly desire to address myself at this time.

The manager or management, as the case may be, should, first of all, be thoroughly committed to the merit of the proposition, *i. e.:* That the gas business is right as a business proposition, and that the product of their works is a much needed commodity in the community in which they operate. The wise, prudent and successful manager or management, therefore, because of strong faith and belief in the merit of the proposition, will be strictly loyal to the same at all times and in all places. They will surround themselves with other persons equally loyal, not to them alone but likewise to the industry which they represent.

Certain practices, through long experience in matters and affairs of a business nature, such practice always yielding like results, are now regarded as an established precedent. To state the matter more tersely, one might say, "business is business."

The practices which obtain in matters of a social nature may be used to illustrate the point in question. For instance, society, as governed and administered by its adherents and devotees, has evolved certain rules and practices, that in effect are quite as rigid and exacting in their demands as may be found common in practice in large mercantile establishments. For instance, if you have no needs nor use for society, society in turn has no needs nor use for you. You are simply dropped from the list of social beings.

The analogy is quite clear—*i. e.:* If you are engaged in some particular line of business in which you have not abundant faith, or if it be that you have just a little faith, the business world will at once, and society in general will very soon thereafter, accept your estimate of the enterprise in which you are engaged. They have a perfect right to assume that you are entirely familiar with theventure in question, and furthermore that your judgment is mature.

Inversely, then, if you have an abundance of faith, and your venture has true merit to sustain it before would be patrons, you will be sure to win; for the business world, and society generally, will quite as readily accept your report of the affair that seems to concern you most.

Faith, confidence and merit are three cardinal virtues in all business affairs and enterprises generally, but they will not stand long alone if not well and strongly supported by proper business methods. If at any time it be discovered that the method then in practice be faulty, it must needs be corrected forthwith. I repeat it. It must be corrected forthwith, and must also be readjusted or corrected from time to time, quite as often as it may become necessary, in order to promptly adjust the same to change of conditions and circumstances attending.

Never wait to be forced into a new or strange position, the choice of which was made by another, but rather, if possible, by your alertness and the judicious use of such foresight as you may be enabled to bring to your aid and purposes, move yourself into some new position of your own selection, and by so doing you will doubtless receive the admiration, if not the commendation of your erstwhile rival, not to mention the commendation of your friends, among whom should be numbered those to whom you are directly responsible, in a financial way at least, for your conduct and exercise of cool judgment.

When I regard in retrospect the methods and practices that obtained during the early years of my experience in the gas business, and in particular, when I compare such with existing practices and general policy of the management of the Company that I represent, it hardly seems possible that we were enabled to sustain ourselves in business under such a narrow, contracted, near-sighted policy.

At the time I entered the service of my present employers (1868), the minimum selling rate for illuminating gas to private consumers was $3 per 1,000 cubic feet. To the city of Toledo, for lighting public buildings, and also for gas consumed by street lamps, $2.25 was the selling price. The charge made for erecting street lamps complete, in readiness for use, was $40 each. An additional charge of $5 per annum for each lamp post in use, to cover the cost of lighting, extinguishing, cleaning and keeping same in proper repair, was also made.

Service connections, connecting our system of street mains with would-be consumers of gas (generally ¾ inch in size), were laid from the street main to line of private property abutting at the expense of the Gas Company, but for all service pipe, from line of street to consumer's meter, a uniform charge of 35 cents per lineal foot of pipe furnished was charged to the property owner.

The necessary meter connections were also paid for by the property owner, and were regarded as a necessary fixture for the owner to furnish. The charge for a 3-light set of meter connections was $4, and all the larger size connections were sold at a price very much higher in proportion. Meter rent was charged in all cases wherein the aggregate of all bills rendered for gas consumed during the preceding year did not amount to the sum of $3. The meter rent charge was $3, and was in addition to such sums of money said consumer may have paid for gas consumed during the term aforesaid.

The Company took little or no interest in the matter of gas supply, beyond the outlet side of consumers' meter. Any fault or defect in house pipes, fixtures or burners was an affair in which the Gas Company seemed not to have any direct interest. It was merely an affair or incident in which the owner or occupant of the property on one hand and some local gasfitter on the other were the only parties in interest. It in no wise was an affair that particularly concerned us. Our duty, as then understood, was to manufacture and deliver gas through the consumer's meter. The use that was to be made of gas after passing through the meter, whether in its use it was to be consumed economically or wastefully, whether or not such devices then employed to consume the gas were in order so as to render good service for the purpose intended, was beyond the pale of duty on the part of the corporation supplying consumers with gas.

Frost in service pipes was a source of annoyance to the gas consumer, yet at the same time it formed another source of revenue to the Gas Company, since they made a uniform charge of 50 cents against the consumer for each alcohol thaw administered. I have still in mind cases, where the charge for "alcohol thaws" represented the major portion of the gas bill rendered for some of the heavy winter months.

Some consumers would prefer to wait until climatic changes would work a remedy in their particular case. It never seemed to enter our minds that we thereby were the losers; having defeated ourselves in

the matter of our greatest source of revenue, *i. e.:* The sale of gas.

All this is now changed, and happily so. Gradually, and by easy stages, change after change, both in the matter of price charged for gas, as well as in all other practices and methods of conducting our industry, has been wrought and brought into common practice, until at present writing I regard it that we are now more fully occupying the real sphere of usefulness for which we were incorporated by the great State of Ohio, and later given life through the medium of the franchise rights conferred upon us by the proper authorities of our city.

They conveyed to, and vested in us, the right, power and privilege to serve the public with gas. In the conduct of our affairs as a corporation, we have been faithful in one phase at least, *i. e.:* We have always served each and all alike. The price per unit of service has always been the same to all private consumers of the Company during any particular term of our operation.

At the beginning, and during the earlier portion of our experiences in conducting the gas business in our city, illuminating gas was regarded, in general terms, as being a species of luxury, and in nowise a necessity. To-day, however, illuminating gas has come to be regarded as a public necessity and in nowise a luxury, and because of this change of opinion or estimate that has been put upon the commodity we vend, correspondingly great changes must have been wrought into the practices of the gas company or management who would conduct a successful business in a given locality.

To convey to you some idea of the change in methods and practice that obtains with us, compared with former times, of which I have previously given you an outline, I will cite the following statements of fact:

Gas is now sold at 95 cents per 1,000 cubic feet for illuminating purposes, and for all domestic and industrial fuel purposes, at 70 cents per 1,000 cubic feet, when measured separately from that used for lighting purposes.

Service pipes (usually 1¼ inches in diameter), and likewise meter connections, are installed without cost to the owner of the property. They remain the property of the Company, by proper form of release executed by the property owner. In other words, it does not cost a would-be gas consumer anything to become a patron of our Company.

House pipes, fixtures and burners are of special interest to us and receive from us every attention necessary to insure good service to our patrons. Gas stoves, ranges, grates, water heaters, etc., are connected in place with suitable gas piping (without cost to consumer), to enable would-be patrons to avail themselves of the fuel rate charged for gas, when same is measured separately from that sold for illuminating purposes, as before stated.

A suitable and proper form of release of the piping so installed is executed by the house owner in each case, and, coupled with the same, we hold the privilege to maintain the piping in place or to remove the same at any time as we may decide.

In all business places we now make yearly contracts (under proper and suitable conditions), agreeing to install and maintain any required number of incandescent gas lamps for regular use to properly illuminate the premises, and this without cost to the consumer, other than the payment of bills rendered for gas consumed.

From the foregoing it is clearly evident that the present policy of our Company is most liberal in its general terms and especially favorable to would-be patrons. The liberality of our present practice is made all the more manifest when compared with methods and practices employed by us quite 30 years ago.

In times past gas companies were generally on the alert to secure the service of some honest, capable person, who, by his particular methods and by close application to his work, would secure the highest efficiency in gas product from a given amount of material used. In other words, the services of the person who could manufacture gas cheaply was the sort of talent that was in greatest demand by the then existing gas companies.

The successful gas companies of modern times, however, are on the alert to secure the services of persons who have all of the above described qualities, but in addition thereto are demanding the further quality and talent, to wit: A person who can secure the maximum gas sales, for it is in the large volume of gas sold in a given locality, and not alone the low cost of production per unit of volume of gas produced at the works, that yields true profit to the owners of gas properties.

Your committee advised me, same as expressed in the opening lines of this paper, that certain members of our Association were rather pessimistic in their views concerning the future of the gas industry. That this is true does not in the least surprise me, when I call to mind situations that it has been my privilege to view in times past. Will cite a case in point to illustrate my meaning.

During a vacation period enjoyed by the writer within the past few seasons it was my pleasure to pass a few days in a small city. It was situated—well, it makes no difference—but I promise to confine myself to facts, so that the location is immaterial. During my stay in the city I met in a social manner the president of the local gas company, as did I also the secretary and superintendent of the company in question.

The president of the company was a professional man, and in successful practice. The secretary and superintendent of the company was also in business in the city. He had an office in which he carried on a brokerage business, with real estate and insurance added thereto. By arrangement with the local gas company, he kept their accounts, and also devoted some of his time to the working interests of the aforesaid company. Neither of these gentlemen was conversant with the gas business generally, nor did they mix or mingle with men who were. Associations, such as ours, had never been graced by their presence, nor indeed had any of their employees been so favored.

The practical portion of their enterprise was conducted by a good, faithful employee, who had long been in their service. Among other duties required of him, were such items as the following:

The laying of mains and services, pumping of drips, taking indexes, attending to complaints, setting and removing meters, etc., the remaining portion of his time being applied in some useful manner about the works of the company. The company in question was no new concern, but rather had been in operation for more than 35 years. During its life the city had grown, both in wealth and population, very materially. Indeed, it was a very pretty, enterprising place in general appearance.

The streets were generally paved, the majority of which, I believe, did not contain a single foot of gas main. I saw large residences that were not even piped for gas, and they were not of recent construction, yet located on streets below the surface of which the system of distributing mains owned by the local gas company had been in place for many seasons prior to the erection of such residences.

The gas company in question laid service connections from the main pipe to line of curb. The remaining portion, from line of curb to consumers' meter, was attended to by the local gasfitters, at the expense of the property owner. The pipe commonly used for service connections was half an inch in diameter of opening, with the result the supply of gas was insufficient and the service rendered was faulty generally.

The company in question did not possess a meter prover. Occasionally, they would resort to testing one gas meter, by passing gas through two meters connected in series, and assume that one of the two in series was "correct" for their purposes. In general practice, however, they were forced to rely upon the "size of the gas bill" rendered as being an index as to whether the gas meter in question was properly performing its duty. Quite all of the consumers' meters owned by the company were connected in place ready for service. When a consumer signified his intention to discontinue the use of gas, an agent of the company would visit the premises, take the "state of the meter," and shut off the gas at the meter inlet.

Should a new consumer make application for gas supply, and were it found that no meter was in place for the duty, selection would then be made from the list of gas meters outstanding and not in actual service. The company would assume that the meter so selected was "correct" for measuring the volume of gas so supplied.

In case a meter in use would cease to register gas passing through, or if the gas bill rendered a consumer chanced to appeal to the secretary of the gas company as being rather small as to amount, a "trade" would at once be made, whereby some other meter owned by the company, and out of commission for the time, would be substituted, and thus given an opportunity to show what it could do, in its particular field of usefulness, as arbiter between the gas consumer and the company. As I now recall it, about 80 per cent. of the consumers' meters owned by the company were in actual use, the remaining 20 per cent. being scattered over the city in various situations. Memory was trusted to properly locate them when again needed.

There was not, so far as I could learn, a single gas range in regular use in that city. If there were such, the active officers of the company were not aware of the fact. Neither the gas company nor any of the merchants of the city had gas consuming devices on display, nor did any of the officers of the gas company seem to possess faith in the proposition generally.

The total sale of gas, in the situation that I have in mind, was con-

siderably below 1,000 cubic feet per annum, per capita of population of the city.

As before stated the city in question had grown materially, both in wealth and population during the life of the gas company herein referred to. In due time, however, other capital, owned and controlled by an entirely different set of gentlemen, was invested in a local electric light company, to bid for favor in the lighting field presented by that community. I did not visit the electric light plant, hence cannot testify as to the merit of its peculiar construction, yet it was my pleasure to have met, in a social manner, some of the gentlemen interested in the venture, and in conversation with them they freely expressed themselves as being pleased with the enterprise in which they were engaged, and gave every assurance that it was an "earner."

A purely superficial examination, in fact I might say that a mere passing glance, at the means of illumination common in that city would readily convince one as to which of the two systems (gas or electricity) was most in favor with local buyers of artificial lighting service.

Upon receipt of word from your committee, requesting me to present some thoughts anent the subject herewith attempted by the writer, the case of the gas company herein referred to, who, by their negligence and apparent indifference to the duty they owed to themselves, and likewise to the community they were created to serve, instantly came clearly before my mind, and I forthwith decided to make use of the same as a case in point to illustrate a type of a very unpopular "Gas Light Company" that was hopeful of securing public favor and patronage during the closing days of the great Nineteenth Century.

The further thought came in quick succession that were any of my hearers (and in particular, those who were pessimistically inclined, to whom your committee made reference) attached to any such corporation as the one herein defined, then, indeed, I could not long wonder that some men engaged in the gas industry might readily develop a severe spasm of genuine doubt, and later appear and freely express themselves as true and devoted pessimists.

Such surroundings and practices would surely be sufficient to create something worse than sincere doubt in the mind of any bright, zealous young man desirous of winning laurels for himself as before his friends, because of his achievements, and furthermore, by strict attention to business, earn profits for the direct benefit of his employers, thereby earning for himself words of commendation, because of his faithfulness to a duty well performed.

What a shock it would be to almost any person when he, for the first time, was made to thoroughly realize that he was actually committed to pursue such a narrow, restricted and unbusinesslike policy and practice?

It has not been my intent nor desire to outline to you any Utopian plan or policy, for the purpose of illustrating any peculiar theory of mine, as to just what would be the most fitting and proper policy for gas companies to pursue generally, neither for any one in particular, for each and every case is so very differently circumstanced, and, therefore, each and every case would, of necessity, require different treatment or handling; and it, therefore, follows that for me to attempt to present any set plan or policy would be sheer vanity on my part, and of no value practically to those who would be kind enough to listen to my expressions of thought.

Communities, as I have observed them, express in themselves a species of personality, and oftentimes quite as emphatically so as do different individuals. Each is different from the other, and because of this fact our treatment of, and manner toward, differs, according to our peculiar estimate of the personality expressed in each.

Applying this thought to the subject of community life, it is quite apparent that larger cities differ from smaller ones. The college town and the strictly manufacturing town each express in themselves a different type of personality.

The method and general policy to be pursued by gas companies operating in different situations, and all differently circumstanced, must likewise differ according to the personality presented, and the same must be arrived at and determined by those having the enterprise directly in charge.

The human family, generally speaking, are "creatures of habit." The quality of versatility is not commonly distributed; therefore in many situations those upon whom the duty devolves to determine the details of a policy to be pursued seem to remain in some fixed state, so to speak. Were they all versatile in their nature they, too, would incorporate changes from time to time, and that just in advance of the absolute necessity demanding the same.

Managements of gas properties who allow themselves to become adjusted in some "fixed state" as above expressed, and persistently allow themselves to remain so for any considerable period of time, will some day be suddenly aroused from their peaceful state of mind and the conviction will be forced upon them that, because of the inertia that has possessed them for a time, and also because of their failure to be alive and act promptly each day as duty and good business sense would demand of them, that because of this combination of the "sins of omission" rather than "those of actual commission," they will have lost caste in the very community they are forced to rely upon for patronage and support. They will have allowed themselves to have drifted into the category of the "non essentials," rather than by proper application and effort to have secured for themselves a sure and sound foothold among the "positive essentials" of the community in which they operate.

There have been many cases of "non-essential" gas companies, in (un)successful operation during the past few years, as the large corps of "buyers" in the field bears mute evidence. The methods that obtain with these so called buyers are quite familiar to each one of us, hence no words of mine are necessary to define the results they achieve. The policy they pursue is such as to yield good returns to the promoters, and also to the actual owners of the properties so administered. The changes so wrought are, in most cases, yielding most flattering results, prime to the owners and operators of the properties in question, and finally, to the community they serve with their product, both by improvement in quality of gas and likewise the character of service they render.

The ready market that is constantly open to would-be sellers of gas properties is a true and ready index of the character of estimate made by practical business men, and likewise men of the "investor" class, when regarding such a problem as "The Future of the Gas Industry" in this country.

Changes in methods and practices are going on constantly, and the necessity for the same is largely due to the constant change in conditions attending. This thought brings to my mind an item that I once before quoted to this body, and as I now recall it, it seems to me that I cannot present language of my own arranging, that would so clearly convey the thought referred to, hence will presume to again quote the item:

"Humility is all very nice, but don't practice it to the exclusion of the other virtues. A little self assertion counts for much. We are rated just a little below our own estimate. If you tell the world that you don't count for much, they will take you at your word, saying that you ought to know. He who is silent is forgotten; he who does not advance, falls back; he who stops is overwhelmed, distanced, crushed; he who ceases to grow greater becomes smaller; he who leaves off, gives up. The stationary condition is the beginning of the end, it is the terrible symptom which precedes death. To live is to achieve a perpetual triumph; it is to assert one's self against destruction. It is to will without ceasing, or rather, to refresh one's will day by day."—Zanesville Meeting, March, 1891.

Discussion.

The President—This very interesting paper is now before you for discussion. Will Mr. Butterworth open the debate?

Mr. Butterworth—I believe there is no ground for pessimism in connection with the outlook for the gas business in this country for two reasons. First, because gas is cheaper then electricity; second, because it presents such a large field for fuel business. These are the chief grounds upon which we can base our hopefulness for the future of our profession. Looking about us we see that in almost every community even now probably two-thirds or three fourths of the lighting is done with oil because it is supposed to be a trifle cheaper than gas. If gas were even only a trifle cheaper than electricity—to say nothing of its being nearly one-half cheaper—you can see what a future there is for the sellers of artificial gas in the realm of lighting. As far as its usefulness for heating is concerned nothing else can compare with it for cooking.

Gen. Harbison—Mr. Faben presents in his very interesting paper thoughts of much value, and the experience and observation to which he alludes are known to pretty much all of the older gas men, partly from and having come under their own observation and experience, and partly from the observation and experience of their neighbors, where they might not be willing to admit they have been following somewhat in the same lines, but still be willing to turn it over as against their neighbor's account. There is not any question, that the success of any company results from the efforts of the manager. He should be in close contact with his constituency, and should know them

personally as far as possible, if they are not too great in numbers, so that he may become acquainted with their wants and conditions to the end that he might meet their requirements with proper remedies before the latter suggested themselves to those whom he serves. Keeping always in advance, his work should be kept up in all of its details. He should not neglect meter complaints and should see to it that all meters are in up to-date condition. The successful gas manager should know the existing conditions in his own city. In Hartford we know at the close of each year, and as often as we choose to figure it out, the whole number of gas appliances sold by our company since we commenced the business of selling. We know what has been sold each year, and can tell from our records what any man or woman has purchased for a long term of years—what the first article was, and what was paid for it; and we know as to the efficiency of the service from a complaint record kept for that purpose. We do not know how many of such articles have been sold by dealers throughout the city. We do not object to all the dealers in the city in that line handling such appliances. The more they sell the better we like it, for the goods they sell will burn just as much gas as those sold by us. I do not, however, believe in the suggestion that we shonld put in services free and should furnish stoves and burners without charge. Sell a good article of gas at a living rate, letting the consumer pay for what he gets, just as he does for the painting of his house, the repapering of his walls and the furniture with which he decorates his home. As soon as you begin to contribute in the way suggested, and which some are practising by giving away these articles, you lower yourself in the repect and esteem which your customers should have for you regarding the manner in which you conduct your business. It is not necessary to give chromos to induce people to burn gas. The main thing our company has given away in its 51 or more years of experience has been good advice. (Laughter.) Of that we have given a lot and it has given us good returns at a low cost. Educate the people to believe the statements you make and you will have no difficulty. You must learn, however, to back your statements up day by day and year by year. Do not make any statement that you cannot verify in a straight forward and frank manner a week hence, a year, or 10 years hence. Carry on your business on these lines and you are beyond unreasonable criticism. You are not afraid of any kind of criticism that can be brought against you in the conduct of your business. The gas business conducted on such lines will surely make your company successful. Get away from the little notions we had a third of a century ago, for such ideas will not do at all in this age of progress. Mr. Faben alludes to this same thought. I remember the time when I thought all that was necessary to do was to have a sufficient supply of gas in the holders to carry us safely through the night. We older members of the profession remember the changes which were wrought by kerosene oil when it first came into market. In Hartford our business shrank in four or five years from an output of 105,000,000 to 65,000,000 by the introduction of kerosene oil and the selling price for gas at the same time went down from $3 to $2 per 1,000. We were trying to stop the introduction of kerosene oil and bring back into the gas field the meters which were not used. We took out more than 1,200 meters from places the occupants of which stopped using gas and to commence the use of kerosene oil. During the first year on the $2 basis we put out 65 more new meters than we had the year previous, and there has been no year since that we have not increased that number; and during the past year more than 1,000 new meters were added to our total number, and our sales amounted to 26,000,000 cubic feet more than in the year 1898. Our rate now is $1 per 1,000 with $1.25 at the beginning of 1898. We are trying to popularize the incandescent gas burners, but we are not giving them away. We are selling them at just enough to pay the expense of handling. We are adjusting them for people and we are guaranteeing the life and efficiency of the mantle at an agreed upon rate per year. It is an entirely satisfactory arrangement to both parties. We will not get rich in guaranteeing the life and efficiency of the mantle at 50 cents a year for each incandescent burner used in house or store, but it will pay the cost and expense (that is all we care for) and give great satisfaction to the customer.

The President asked Mr. McIlhenny to speak.

Mr. McIlhenny—I certainly can say that the paper is interesting enough to be read over and over again. It shows in a very attractive way the contrast between the old and new conditions covering the gas business, and as to the outlook for it in the future. As to the latter it seems to me there is certainly no cause for pessimistic views in the cities throughout the country. From all directions we hear that the gas business is growing apace, notwithstanding the increased use of electricity and the other forms of lighting. I believe that our output will continue to increase. One comforting thought which we can lay hold of is that there has never been any substantial commodity used by the people that can be driven out of use. When candles were used so generally the candlemongers made complaint when lamps were first introduced, and a gentleman, who was in London several weeks last summer, told me that he saw in the British Museum a copy of an address, issued about 200 years ago by the Candlemongers' Association of London, to Parliament, protesting against the manufacture of "lanthorns" as they were called (or lanterns), stating that they were at great expense and trouble to educate their apprentices and establish their business, and it looked like the introduction of these "lanthorns," using tallow or other substances, by which a man was enabled to hang a light outside of his door at night and thus throw light in front of his place, would drive out of use candles for illumination. But to-day more candles are made, sold and used than ever before in the history of the world, notwithstanding the fact that since candles had their day, oil, gas and electricity are in the lighting field. I think nothing which has been generally used by the people has been entirely dispensed with. Extra demands and needs of the people, as civilization advances, take care and absorb all of the old articles as well as giving a great capacity for the new. It is a comforting thought that no matter what may come, we may realize that gas still has its field for usefulness. The cost of manufacturing is being reduced, new fields of usefulness are being opened up, and I for one have every confidence and am full of hope for the future success of the gas business.

The President called upon Mr. F. W. Stone.

Mr. Stone—I hardly know whether I am a pessimist or an optimist, but I feel this way about it. I believe the pessimist is one who would use all of the inducements set forth in the paper to advance the sale of his gas. That is, giving away appliances, putting in free services and keeping up Welsbach lights for nothing, etc. It seems to me a man having faith in the merits of the thing he was selling would not find it necessary to do that. If you educate people up to expecting things for nothing you will find in the end that they demand them. If you let them alone, usually they do not desire them. Educate people into the belief that gas is the thing for them to use, because of its merits and advantages, and they will not only buy gas but also the appliances to use it, so that it will not be necessary for you to give such things away in order to help the business along. Sometime ago a ladies' literary society was organized in our town. They had a little social one afternoon and after the entertainment a lot of sandwiches were still on hand. One of the ladies suggested it would be a nice thing to give the sandwiches to one of the little boys who belonged to her Sunday School Class. The basket was taken down and given to the boy. The next week she met the boy and said to him: "Johnny, how did you like the sandwiches?" He said, "We liked them first rate, ma'am, and papa told me to ask you if you didn't have a pair of pants you could give us too?" (Laughter.) That is about the way of it. If you give people something free at one time they want something else after a while. They crowd their demands for something else on you, and pretty soon you find that there is no end to the demand and you will be doing business without any profit. I do not believe in giving away everything in order to secure business. It seems to me there is a fever abroad in the gas business at the present time among some companies, who seem to want to get business at almost any price. It does not make any difference what they have to give away or what they have to lose as long as they get the business. They want the volume regardless of the cost. In my belief whatever you put out for nothing is a species of advertising, and when you pay out money for advertising, you not only expect to get back interest on it, but desire to get back the money itself. Advertising does not pay unless you get back the interest and the principal. When you put out fuel appliances, or give things away to induce people thereby to use gas, you have to charge the cost to either capital or expense account. If you charge it to expense it cuts down your profits, if you charge it to capital after a while you will find that your capital account is loaded down; that you will have either a big capitalization or a big construction account with little to show for it. For instance, the cost of setting a range for Mrs. Brown to-day is $3 for labor and $2 for pipe. Mrs. Brown in a short time moves out and Mrs. Jones who comes in wants her range on the other side of the room. She does not like the location where Mrs. Brown had it at all, and you have to change the piping and reset the range, and another $3 is added to your investment. It is my experience that it is not necessary to give things away. If you advertise the merits, advantages and convenience of gas you will not have to give appliances away in order to increase the demand for it. I believe in giving good service and keeping down the price. You cannot

cut down the price of gas so far as the selling price is concerned and at the same time give chromos, free service, free burners, etc. They all figure in the cost of operation. You have to get out even and, therefore, are not able to sell gas as cheaply as you otherwise could. Hence, I say, cut down the price of gas to the lowest possible selling price, give good service, close attention to the business, hustle for new business, go and see your customers frequently, advance the business, advertise it in every way you can. That is the way to success rather than through giving things away. I wish to say, in justification of myself, that in my own experience in the last 4 years we increased our output from 5 million feet to 20 million feet, and are not doing any free business at all. We have not found it necessary. I think 70 to 80 per cent. of the people located along the lines of our mains are using gas to-day. We have secured this large percentage simply through solicitation, going to see them and presenting to them the merits of the gas we sell.

The President—It might be interesting in that connection, Mr. Stone, to state to the members of the Association the increase in the population during that same period.

Mr. Stone—The increase in population was from 10,000 to 13,000 in the last 10 years—while we have a population of 13,000, we only have an available population of 10,000 so far as the Company is concerned, because there are 3,000 people across the river where it is almost impossible to reach them. They are from 1½ to 2 miles away from the location of our works, with a stream 21 or 22 feet in depth between and a line of ore docks. It is not impossible to get across, but we do not think the business on the other side would justify it just at present.

Mr. Andrews—It seems to me the policy we should adopt is one which is a mean between the two which have been spoken of. I do not believe in giving stoves or utilities of that kind away, but I believe in selling them at the lowest possible figure. When it comes to putting in service pipes and connections I have always made a practice of charging to labor the expense of making the connections, charging the actual material used to capital account. That obviates the difficulty spoken of by Mr. Stone of increasing the capital account out of all proportion, or on the other hand making your expense account too heavy. That pipe remains there. It is used for the purpose of increasing the output of your works. On the other hand, if you charge all the expenses to the consumer, the result is that while you may get some business it comes slower. People will consider quite a number of things before they go to the expense of putting in service pipes. Take, for example, a service which costs $10. Average results show that you should get in the neighborhood of at least $1.50 per month from it, or from $18 to $20 per year. You can afford to pay for the cost of that service out of your earnings, but the plan I spoke of enables you to get fair interest on the investment and to retire it within the life of the service.

Mr. Stone—I do not wish to take up too much time, but another point I would like to make in regard to this matter, especially as far as Ohio companies are concerned, is this: Ohio companies are to a certain extent under the jurisdiction of local authorities in regard to the fixing of prices which shall be charged for gas. If you give away stoves they say there must be a tremendous profit in the business. If the company gives away three stoves and three ranges they will say the company will do almost anything to get the business, and thus conclude there must be an enormous profit in a business which will enable its operators to be so liberal. You will have the City Council asking for a reduction in the price of gas. You will find a fight on your hands which might have been avoided by furnishing good service and selling the gas correspondingly lower, so that there would not be a comparison between your company and a company in some other city 10, 15 or 20 miles away in the same State.

The President—We have with us a gentleman from Madison, Wis., from whom I am sure we would like very much to hear.

Mr. Malone—At Madison we have had considerable experience concerning the placing of gas stoves. We have placed about 1,500 ranges in the last 4 years, starting in late in 1896 with about 200, and now we have about 1,750 out. We have charged for everything. We get an average of about $9 for services and sell our stoves a little in advance of actual cost. We made a personal canvass from house to house. We have data on our records of every house in town. We have increased our sales of gas from 18 millions to 52 millions in about 2½ years. Our population increased in the last 10 years from 13,000 to 19,000, but the greater part of the increase was in the last 5 years. One thing I think that adds as much as anything else to the success of a gas company is the giving of strict attention to complaint work. Many people imagine their bills are too high and complain. We volunteer to have a Professor from the University to test the meter. If it is found to register fast we rebate for six months the amount of increase over what it should have been when tested. We get good returns for our efforts by educating the people up to feel that they are getting value received for whatever they pay. Last month we had but three complaints on account of big bills; and some of our consumers had larger bills than for the corresponding month the previous year and entered complaint. We always give complaints immediate attention. Fuel sales average about 66 per cent. of our gas output. The electric light plant is also run by the same corporation, and we have never endeavored to push illuminating gas. We have never pushed either one.

Mr. Butterworth—Mr. Malone states that they never pushed either one. I think he means they never pushed one as against the other, but that they have endeavored to push both.

Mr. Malone—I intended to so say. We have not pushed one as against the other, but have done our best to advance the interests of both.

The President—Mr. Butterworth, you probably have some information as to what was done in Milwaukee, Wis., by Mr. Cowdery.

Mr. Butterworth—Milwaukee is recognized as the banner city of America for the sale of gas, all things considered. More gas is sold per capita there than in any other city in the United States, similarly situated. The average, I believe, is 3,500 cubic feet per capita per year. They do it by having a sliding scale for gas used for fuel purposes and another sliding scale for gas used for illuminating purposes, based on the quantity used in each case. They try to meet all demands in that way, and do a large business. I was thinking, however, that our discussion has taken a turn rather different from that suggested by the paper. I think we are getting a little off the text. The paper calls, I believe, for an expression of our opinion as to whether we need to be discouraged about the future of the gas business. It does not call for tests as to how we manage the business, although I take it, we can gather from the tone of this discussion that, by following methods for cultivating our business in the way suggested, we have small need for despair; to the contrary, there is every reason for confidence. I think that is the view we all have of this matter. I would like to have a rather more emphatic indorsement of the idea that there is no occasion for pessimism as regards the gas business.

Mr. J. R. Lynn—Mr. Faben's paper is not only historical and practical, but in it there is much of valuable philosophy. As far as our relation with the consumer is concerned, I think the majority of us are compelled to pat the consumer a little bit on the back. Regarding the remark of Mr. Stone, respecting City Councils and their attitude, I presume we will be compelled to pat them on the back, too. As to giving away appliances, I think that is a local affair altogether. As Mr. Faben has to contend with natural gas competition he is compelled to exert himself a trifle more than Gen. Harbison has to in Hartford where natural gas is not known.

Mr. Persons—They have oil there, just the same as we have.

Mr. Lynn—I do not think we lose anything by occasionally passing out an appliance to a consumer, such for instance as a mantle, or something more, free of charge where there was a consistent cause for complaint in regard to the service. So far as the business in general is concerned, I do not see that any of us have any ground for taking a pessimistic view of it.

Mr. Persons—I think the Toledo Company was the first in the United States to offer free installation and maintenance of incandescent gas lights. The Company adopted a form of contract offering to give a business house, using a certain number lights, free installation and maintenance of incandescent gas lights. For instance, if a store is not properly arranged for lighting to the best advantage, the Company is putting in what is known as "H & M." fixtures with incandescent lights, and maintaining them free of expense. That seems to be in the policy of the Company the best way to meet an emergency which confronts them. Gas men who have to contend with natural gas have to conduct their business on different lines from those of a company not beset by such competition. A company simply having oil as a competitor may not think it advisable to do these things. I think, however, some of the people here present—for instance, Mr. Printz, who has had to meet natural gas competition—could give testimony that would back up the policy of the Toledo Gas Light and Coke Company. Of course capitalization and the like have much to do with the whole affair; yet it is simply a matter of policy. It is just like the tariff. I do not believe anybody can lay down rigid rules for selling gas outside their own towns.

Mr. G. D. Roper—I am not afraid to get up in an Ohio meeting, be-

cause this is the only place where a supply man is supposed to have any brains. I would like to say that if anybody has any doubt as to the future of the gas business let him take "Brown's Directory" for the last 10 years and convince himself that it has an assured future. By an inspection of that Directory you will see that a man selling 1 million feet of gas per 1,000 inhabitants was considered a hustler, but now the company that is not selling more than that is not considered in the business at all. He stood still, as Mr. Faben said. If you have any doubt on that point study up the subject yourself through the medium of "Brown's Directory." I had the pleasure yesterday of being at Aurora, Ills., where I saw Mr. I. C. Copley, who is building a plant at La Grange, Ills. Although he does not expect to turn the gas on for 6 weeks or 2 months, he has 231 houses piped and over a car load of stoves already sold. If anybody has any doubt as to the future of the gas industry he should simply take a few of these facts home and study them.

Mr. J. R. Lynn—A remark made during this discussion, regarding the charging of these various donations to different accounts, prompts me to say forcibly that there is really more good, everyday, sound, horse sense in selling, say, 3,000,000 cubic feet of gas at a profit of 30 cents per 1,000, than there would be in selling 2,000,000 at a profit of 40 cents. If you are compelled to spend a little money to get that additional consumption, you are certainly well paid in the additional aggregate profit received.

Mr. Printz—As Mr. Persons said, we in Youngstown have competition with natural gas and as a consequence we have to do many things which we would not otherwise do. We were selling gas at $1, and after natural gas came in, we found that, even with gas at that price, we were losing our consumers. In order to hold them we loaned the burners and maintained them. We do that not only for business but for private houses, limiting the number of burners in the former to 1 for each $3 worth of gas used per year. The average number of burners in a house is from 3 to 4. It costs us for that maintenance about 15 cents per 1,000 feet of gas sold, and so far we found the practice one of wisdom. Although we did not hold all our consumers, nevertheless we held many that we would otherwise have lost. We furnished not only the burners but the fixtures. However, they are all loaned, so if the customers leave us at any time we can get our burners and fixtures back. Some of the speakers told about putting in free services and furnishing other appliances. For a number of years we endeavored to sell stoves, bnt found they went very slow when we charged full price for the stove and the setting thereof. Afterwards we made arrangements to sell the stoves at cost and set them free of charge. From then on we had no trouble in placing the stoves, and we did a good business in our city of 23,000 or 24,000 people. We were selling about 53,000,000 feet a year of gas, and I can say to-day, even in competition with natural gas, we sell some few stoves. It is to our advantage to sell the stoves at cost and set them free of charge. That is one of our modes of advertising.

Mr. F. B. Many—Not anything has been said up to this time about street lighting. Up to 5 years ago, as you all know, you were losing your gas street lamps all over the country. Incandescent gas burners have succeeded within the past year in relighting 100,000 gas street lamps in the United States, burning 12,000 feet per year. That is one of the great gains for success in the gas business. The amount of street lighting which has been changed from electric lighting to gas is astonishing. Over 200,000 lamps within the last three years, and a great many of these posts have been in disuse from 1 to 10 years, not consuming 1 foot of gas. That is something to think about when you are considering the present and the future of the gas industry. Putting a 60 candle power lamp every 150 feet gives the most perfectly lighted street you can get. Electric lamps will give better lighting, if they are put close enough together, but the expense is so great that cities cannot afford to do it.

Mr. Butterworth—Mr. Many, is it a fact that Liverpool, England, shut down its municipal lighting plant and adopted Welsbach lighting wholly?

Mr. Many—Yes, sir. Liverpool, England, is putting in 25,000 Welsbach lamps. Paris, France, made the show city of the world by turning night into day, was lighted with gas. Gas, however, was superseded by electricity; but now it is all lighted with gas by means of 32,000 Welsbach burners. Munich, the great art center of Europe, has 7,000 gas lamps; Berlin, acknowledged to be the best lighted city in the world, has discarded its arc lights and replaced them with 35,000 incandescent gas burners. Glasgow, Edinburg, Leith, Naples, Weisbaden—in fact, almost every prominent city in Europe is inaugurating the incandescent gas system to replace arc lighting. In this country the principal cities are gradually but rapidiy recognizing the great advantages of this new system. In the United States Cleveland, O., has 5,400 Welsbach lamps, which displaced 1,892 arc lights. All of our cities, large and small, are adopting Welsbach lighting for their streets. Some of our larger cities use gas profusely, placing the posts close together and using clusters of lights. We are about to equip Superior street, Cleveland, from the public square to Water street, with 29 posts and lamps similar to those in front of the Gas Company's office in Dayton, which are of the 3-pronged burner type. The distance is 1,300 lineal feet, putting 14 lamps on one side and 15 on the other. The lamps are arranged upon the 3 pronged burner plan, affording 360 candle power on each of the posts. That street will be lighted like some of the brilliantly illuminated boulevards of Paris. It will make the street much lighter than by arc lighting, because many lights are preferable to a smaller number of lights with greater candle power. A myriad of lights is preferable to a few lights of larger units. You have a chance with gas to do what electric light companies have hoped they would be able to do, and that is to have a lesser unit of light with a larger number of lamps. For instance, they had what was called a nominal 2,000 candle power lamp. If that could be split to 200 candle power, or as they call it, a nominal 200, then they could afford to light streets in the way in which we are lighting them with the Welsbachs, and could afford to put a lamp at each intersection. They cannot do it now, because it costs too much. However, lighting with gas, you have a 60 candle power light which costs anywhere from $24 to $30 per post. You can afford to place that light anywhere, not only at the intersection of an alley on the main street, but through the alley. You have a smaller unit and you can afford to put them correspondingly closer together. Gas companies should wake up and take advantage of the opportunities thus afforded them for very materially increasing the consumption of gas.

Gen. Harbison—I was very much interested in hearing the representative of the Welsbach Company make his statement, because the subject of street lighting is a matter of a good deal of importance to the gas manager. In Hartford some years ago we had 1,200 or 1,300 street lights. We have not now one; the electric lighting company has them all. At the starting of the latter company the city officers were interested in the electric lighting plant to the point of seeing that the street lighting was done by means of electricity. I have been trying for 3 years to get the Welsbach Company to make a rate which would permit us to instal their street lights—I hope the representative of the company who has just spoken will have both ears open to what I am about to say. I have been trying to get them to come to our city to instal some lamps. An arrangement was all made by which the city authorities having charge of that department, could eliminate any number of electric lights and substitute gas at their pleasure. The wording is in the contract with the electric light company at my request, and I have offered the Welsbach Company to supply them with the gas at $1 per 1,000 per year, for all-night lighting, and get for them $25 per lamp per year from the city. However, I have not been able to move them one hair below $30 per lamp. With electric lights at $75, as they are distributed on our streets, we cannot on an average displace more than 1 electric light with 3 gas lamps until we have given it a good test. The price thereby would be the same. This is the first time in the history of street lighting by means of Welsbach lamps that a price below $30 has been mentioned, by a representative of that Company in my hearing. I was very glad to hear the gentleman say "from $24 to $30," because that makes it a little bit hopeful for us that they will be willing to come to Hartford and take $25 per lamp. In connection with that I might say I have been experimenting as to what will do for outdoor lighting. On the lawn at my own residence I installed a lantern on a post, 120 feet from the side door. I have on it an old, square, city lantern. I got some glass and fitted it around the pipe going up through, so that too much air would not enter, and I burn gas in the lamp which is supplied with a Welsbach mantle. It furnishes a strong and permanent light. There is no royalty on lantern, stop-cock or anything; it is simply an ordinary lamp with a Welsbach mantle. I made this statement a couple of years ago in a convention to 3 or 4 gentlemen representing that concern, who were present and heard it, and I invited the people to come to my house and see the lamp burn. It burns on the lawn every evening from dark to daylight, and it simply goes to show it is not necessary to have a patented lamp, fixture, stop-cock or globe to get efficiency. It is not necessary that it should cost $13 per lamp per year to maintain the outfit and take care of the lighting and renew the lanterns. There is too great a profit in it at the price which they insist for maintaining. I mention it here in the presence of their representative to this Asso-

ciation, as I prefer to say what I have to say so that it may go directly to them.

Mr. Many—I simply want to say that the price for street lighting is entirely based on the price of gas. Here in Ohio we have natural gas.

Gen. Harbison—I am talking of gas at $1 per 1,000.

Mr. Many—We get the gas delivered at the burner here in Ohio at $6 per post. Twelve dollars I may say is too much for gas. The price of the Welsbach street lighting is based entirely on the price of gas. Do you see my point?

Gen. Harbison—No; I do not. Twelve dollars is not too much for gas; and if you get $25 per lamp $13 is too much for maintenance.

Mr. Many—You do not seem to catch the point which I make.

Gen. Harbison—No, I admit that I do not.

Mr. Many—Allowing you $12 per lamp, we cannot do the work for $25. If we are willing to give you the $12, why should you not be willing to let us get our price? We have no objection to the $12; then why should you object to the price we get? That is the only point where gas companies and our company have had any hitch. What difference does it make to you what we get, since you get your figure? We never question your figure. In Boston, Baltimore and other Eastern cities, we give $12 to the gas company and we charge $30 for the work. That is our price. You ought not to complain about that when you are getting what you ask. In Ohio, where there is natural gas, and where the gas company gets $6, we get $24; we get $18, for maintenance and the gas company gets $6.

Gen. Harbison—The main cause of complaint is that you cannot get them introduced in our city at more than $25. The arc light costs $75, and it takes 3 Welsbachs to displace 1 arc.

On motion of Mr. McIlhenny a vote of thanks was tendered Mr. Faben for his paper and for the very general discussion which followed its presentation. The motion also included a tender of sympathy to the author because of the illness that kept him away from the meeting, with the further wish and desire that he be shortly restored to his usual good health.

On motion of Mr. Andrews, a vote of thanks was passed to Mr. Fred. Persons for his clever reading of Mr. Faben's paper.

[To be Continued.]

Electric Incandescence Arcs.

Engineering says that since we may in general assume that the highest light radiation goes together with the highest temperatures, Ewald Rasch, of Potsdam, has attempted, apparently with decided success, to produce the electric arc between the most refractory oxides of the earth metals—magnesium, thorium, zirconium, etc. These oxides become good conductors of the electric current, when duly preheated. How this preheating is accomplished is not explained in an account given in the *Elektrotechnische Zeitschrift* of February 14; the details are probably reserved for the patent specifications. But the general idea is indicated, and the experiments are of considerable interest. An auxiliary arc is utilized to heat the ends of the refractory electrodes, and the auxiliary electrodes serve also as current leads. The energy concentration thus realized is very high, and may amount to more than 30 and 40 watts per square millimeter of electrode surface. The light is brilliant sun-white; yellow and green rays predominate in the spectrum, which is not continuous, but consists of lines and bands. Probably we have two superimposed spectra; but we have, at any rate, also to deal with a spectrum, and, indeed, a corona of incandescent vapor is distinctly marked. In how far that volatilization of the electrode material would impair the life of the electrodes, and complicate the construction of the lamps, is not stated; the experiments seem to show, however, that the wear cannot be considerable. The color of the light can be varied at will by the addition of certain oxides. As regards his experiments, the author distinguishes between electrolytic electrodes which have a high resistance when cold and a high starting temperature, and electrodes of moderate resistance in the cold and moderate starting temperature. The former Rasch calls hard electrodes, the latter soft. The terms do not appear to be well chosen; but they are justified, in so far as the moderate conductors soften and melt in the heat of the arc; they have the further bad quality that they incline to forming a liquid bridge between themselves, which, of course, makes an end of the arc. Hard electrodes behave much better, and are most economical. Electrodes 2.5 or 5 millimeters in diameter, gave with currents of 40 or 50 volts and 3 or 5 amperes respectively, illuminations of 600 and 900 Hefner candles—that is, an average of 3 or 4 candles per watt. With a constant arc length of 1 millimeter, the light yield expressed in candles per watt, increased with the watts. The curves show that this increase continues until we approach the limiting value—5.21 Hefner candles per watt; the electrodes then begin to melt. It is noteworthy that this figure 5.21 candles per watt, or, expressed in the opposite way, a current consumption of 0.19223 watt per Hefner candle, represents, according to the theoretical deductions of Tumlirz concerning the mechanical equivalent of light, the ideal light yield. Though it will not be advisable to push the current to this extreme, the new incandescence arc light promises to be exceedingly economical. Rasch compiles a table which certainly illustrates the advantages of his lamp; we reproduce it:

	Hefner Candles per Watt.	Watts per Hefner Candles.
Electric glow lamp.....	0.29	3.0—4 0
Nernst lamp.....	0.66	1.5—1.6
Arc lamp, alternating current	1.25	0 8
Arc lamp, continuous current.	2.00	0.5
Electrolytic lamp.....	3—4.00	0.25—0.3

We regret the adoption of the term "electrolytic arc," which is more suggestive of Wehnelt experiments than of these new electric incandescence arcs. Though there may be a long step from these arc experiments to a practical arc lamp, the investigations certainly deserve attention.

The Widespread Use of Special Machinery.

Iron Age says that the use of special machinery is a noteworthy feature of modern industrial development. It is the result of persistent study to reduce costs, to increase output, to make more perfect goods or to manufacture newly invented articles satisfactorily and cheaply. It has been well said that an American mechanic not only invents wonderful labor saving machines, but he also invents machinery to build the machines. This statement was never so widely applicable as it is to-day. Whether one visits implement factories, tool making shops, stove works, novelty factories or small shops making specialties he is impressed with the fact that the presiding mechanical genius of the establishment has evolved machines to greatly expedite the work at various stages or to accomplish some difficult feat in shaping metal. It is one of the peculiarities of American mechanics that in the evolution of an idea a device of totally new form may be found an essential part. When perfected perhaps no standard machine or process will produce it to the satisfaction of the inventor. It may sometimes happen that an invention cannot be utilized because it requires a part or parts too difficult or expensive to make for the purpose. Ordinarily, however, the inventor is not not vanquished by such an obstacle, but proceeds further and originates a method by which his purpose is accomplished. Much is being done in this way in small shops, in which the use of special machines would hardly be expected. It can be said, however, that few metal working factories of any pretensions can be found in which the machine shop is not employed to some extent on special machines for their own use, and which are preferably built on the premises. The experimental department involves considerable expense, and much money may at times be sunk in it without an adequate return, but it is found necessary for the vitality of the enterprise. The manufacturers who do not experiment or who are not on the alert to find something better than they are using or producing are in danger of being left in the rear.

This peculiarity of our mechanics is what has given American manufactured products such an ascendency in the world's markets. And this ascendency they will hold until some other race or nation develops a superior faculty for originating machinery. The foreign manufacturers who have, as they believe, Americanized their plants by equipping them with the most modern American machinery, have not after all secured the secret of American mechanical success. That cannot be transferred, although it is no longer a secret. It is to be seen in practically every workshop, and its sign is the special machine.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

MR. ALBERT DUNBAR, formerly Superintendent of Street Department, Brookline (Mass.) Gas Company, has been appointed Superintendent of the Dorchester (Mass.) Gas Light Company. He took charge of his new field the 1st inst.

A CORRESPONDENT in Seattle, Wash., writing under date of March 28th, says that Messrs. W. P. Elliott and Lee Baker have filed articles incorporating the Pacific Gas and Mining Company. According to the articles the pripcipal place of business will be Port Townsend, Wash., and the objects of the concern are to engage in and operate and maintain a general gas and mining business in the State of Washington, in-

cluding the finding and transporting of petroleum, natural gas, etc.; to prospect and mine for all kinds of minerals and coal, and to operate and maintain coal and water gas plants.

MR. J. W. BAKER has been appointed Superintendent of the plant that is to be constructed by Mr. Addison Ely and his associates for the supply of gas to the New Jersey districts of Dover, Rockaway and Port Oram.

A CERTIFICATE announcing the merging of the College Point (L. I.) Gas Company with the Newtown and Flushing Gas Company, of Flushing, L. I., has been filed. The names of Frank Tilford and H. L. Snyder are on the certificate.

THE Board of Awards, Baltimore, Md., has contracted with the Consolidated Gas Company to furnish gas to the street lamps at the rate of $7.25 per lamp per annum. If an average consumption of 2½ cubic feet per lamp per hour is exceeded, the excess is to be paid for at the rate of $1 per 1,000. The contract is to run for 27 months, from the 1st inst.

GAS buoys having been placed at the entrance to the channels at Buenos Ayres, S. A., steamers are now allowed to sail therefrom at night.

A CORRESPONDENT incloses the following: "About a fortnight ago Attorney-General John P. Elkin granted the application of the Hyde Park (Pa.) Gas Company for a writ of quo warranto to compel the Consumers Gas Company to show cause why its charter shall not be declared null and void. The Consumers Gas Company is the new corporation, formed by Messrs. A. J. Casey, Arthur Long and others. It was granted a charter to manufacture gas and supply it to residents of Scranton, Pa., for lighting, heating and power purposes. It applied to the City Councils for a franchise permitting it to lay gas mains in the streets in order to perform the services for which it was incorporated. Action in the franchise ordinance was, as subsequently reported in the JOURNAL, postponed a short time ago. Meanwhile the Hyde Park Gas Company, which is one of the component parts of the Scranton Gas and Water Company, began proceedings before the Attorney General to have the new Company's charter annulled. The Hyde Park Company claims exclusive rights to furnish gas within the limits described in its charter until it has earned and paid dividends equal to 5 per cent. on its capital stock for 5 years. This, the officers of the Company claim, has not been done. Now that Attorney General Elkin has granted the quo warranto writ, proceedings will be instituted in the courts of Dauphin county to compel the Consumers Company to show cause why its charter shall not be abrogated."

AT a meeting of the Directors of the Cincinnati Gas Light and Coke Company Mr. Briggs S. Cunningham was elected to the vacancy in the Board occasioned by the death of Captain George N. Stone. Appropriate resolutions respecting Captain Stone's worth and value in point of service to the Company were adopted. It is understood that Mr. Cunningham is decidedly favorable to the actual amalgamation of the Cincinnati Gas Light and Coke Company with the Cincinnati Edison Electric Company.

THE Western Gas Construction Company will construct, at Station A, of the Detroit City Gas Company, a 10-foot set of its improved Lowe double superheater water gas apparatus; and at Station B, which will be remembered as the site of the old Detroit Mutual works, the Construction Company will put or place an 8 foot 6-inch set. The contract also includes the placing of two outfits of the Construction Company's improved duplex boxes, 20 feet by 20 feet, with all necessary connections and valves.

AT the election held for the purpose of ascertaining whether or not the franchise of the Clinton (Iowa) Gas Light and Coke Company should be extended, according to the terms of the agreement reached by the authorities and the Company, the "ayes" had it by a huge majority. Mr. Highlands and his associates will now go on with their planned works' improvements. The Clinton folks are in no sense pessimists over the present or the future of the gas business.

THE proprietors of the Union Gas and Electric Company, of Waterville, Me., have purchased the properties of the Waterville and Fairfield Railway Company.

THE Cleveland projectors who obtained a franchise for the construction of a gas works at Springwells, Mich., have given a bond in $5,000 that they will within a year furnish gas to the township, in accordance with the terms of the ordinance.

MR. GEORGE E. MCLEAN and associates, of Dubuque, Iowa, have virtually completed the preliminaries for the construction of an adequate central lighting station on gas and electric account at Waterloo, Iowa.

AT the annual meeting of the Knoxville (Tenn.) Gas Light Company, the officers elected were: Directors, R. R. Swepson, L. H. Spilman, W. P. Washburn, J. Y. Johnston, E. H. Saunders, F. L. Fisher and J. E. Hood; President, R. R. Swepson; Vice-President, L. H. Spilman; Secretary and Treasurer, E. H. Saunders.

THE operator who bagged quite a considerable sum of money through breaking the boxes of several prepayment meters in Troy, N. Y., has been apprehended. His name is John Fleming, and his case was to have been considered last Friday. We will report the eventual finding.

A CORRESPONDENT in Detroit, forwards the following: "The proprietors of the Muskegon (Mich.) Traction and Lighting Company have announced a new selling schedule. Under its operation these prices are to prevail from the 1st inst.: For lighting account, 1,000 to 5,000 cubic feet per month, gross $1.60; net $1.40; under 1,000 per month, $2 gross; net $1.80; for lighting, power and heating use (through special meter), gross, $1.20; net, $1."

MR. PAUL DOTY has assumed his new task of General Manager to the Detroit City Gas Company. He proposes to more than ever popularize the use of gas in Detroit by means of liberal, but nevertheless common sense, business methods.

THE Berlin Iron Bridge Company has contracted to furnish to the Province of New Brunswick, Canada, 4 bridges. There will be required four 63-foot riveted spans, one 150-foot, through pin connected span, one 200-foot, deck-pin connected span, and one 80 foot, deck-pin connected span.

THE Selectmen of Winthrop, Mass., have granted a franchise for the supply of gas there to the proprietors of the Suburban Gas and Electric Company, of Revere, Mass. Our informant adds: "The conditions are that the Company must have 8 miles of pipe laid before July 1, 1902, or forfeit $1,000; it must insure the town against liability from accidents during construction work time; it may not charge in excess of $1.20 per 1,000 cubic feet at any time; and at the end of 18 months the rate shall not exceed $1.15. It is also agreed that, at the reasonable request of the Selectmen, the Company will light any public building, place or square without cost. The terms of the franchise are quite like those granted some time ago to the Suburban Company by the authorities of Revere."

"T. J. M., writing under date of March 30th, says: "Your late report of the new price for gas in Williamsport, Pa., was incorrect. After May 1st the charge for gas used for fuel purposes will be $1.10 per 1,000 gross, with 10 cents per 1,000 off for prompt payment. There has been no change in the charge for gas sold for illumination." All right, sir.

THE House of Representatives, Committee on Incorporations, State of Connecticut, has reported unfavorably on the petition for the incorporation of the Naugatuck Gas Company.

THE gas plant at Traverse City, Mich., is an assured construction. The site has been purchased, and Messrs. Webber & Gallagher assert that the works will be finished by September 1st.

THE following is from the Montreal (Can.) *Star*, dated March 25th: "The 52d annual report of the Montreal Gas Company states that the past year's business, as proved by its reports, shows a net revenue profit of $391,988 53, as against $373,147.56 for the previous year. There were declared two semi-annual dividends of 5 per cent., amounting in all to $299,864. The increase in the gross and net revenues of the Company during the year has been satisfactory. The Directors have placed $5,000 to the credit of the contingent and insurance account. The large amount chargeable to legal expenses is owing to the final settlement of the Vasey case, which has been pending for 9 years. This is the last of all old claims outstanding against the Company. During the year 8.4 new services and 9.92 miles of new mains and services were put in and 2,752 meters were installed. There have been 1,548 gas stoves and 4.8 gas fires, generators, etc., sold during the year. This branch of the

(*Concluded on page* 535.)

THE AMERICAN GAS LIGHT JOURNAL

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PROPRIETORS.

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MONDAY, APRIL 8, 1901.

(*Continued from page* 534.)

Company's business continues to increase. The report notes that the illuminating power and purity of the gas were maintained at a high standard. The works and plant of the Company have been maintained in a state of efficiency, and the following additions have been made to the Hochelaga works: A coal shed of 6,000 tons capacity; new coke conveyor, bins, etc., set of condensers and an addition to the retort house. The scrubber building, which was destroyed by fire on March 1st, 1900, has been rebuilt, and two efficient washers installed in place of the two tower scrubbers. At the request of shareholders holding a large amount of the Company's stock, the Directors have applied to the Provincial Legislature for an amendment to the Company's act, providing that each shareholder shall have one vote at all meetings for each share of stock held; also, that all Directors retire annually. The total revenue of the Company for the year amounted to $830,925, and the total expenditure was $438,943. The profit and loss accounts, from 1st March, 1900, to 28th February, 1901, is as follows:

	Dr.
Interest on bonds	$37,963.15
96th dividend	149,932.00
97th dividend, payable April 15, 1901	149,932.00
Legal expenses, damages, etc	16,209.81
Interest on temporary loans and customers' deposits	6,685 37
Contingent and insurance account	5,000.00
Balance carried forward to next year	354,969.62
Total	$720,691.95

	Cr.
Balance brought forward from last year	$322,610.28
Sundries	6,099.14
Net revenue for year	391,982.53
Total	$730,691.95

DESPITE the showing above made it looks that those in control of the Montreal Gas Company (meaning of course its Directors) are about to recommend an alliance with the electric lighting end of the Montreal plan. Forget is the name of the "financier" who is conducting the negotiations.

MR. A. J. SCHULTZ, formerly President and General Manager of the Schultz Bridge and Iron Company, Pittsburg, Pa., has been appointed to take charge of the operating department of the American Bridge Company, covering the Pittsburg district, which comprises the Pittsburg, Keystone, Schultz and Shiffler plants, at Pittsburg; the wrought iron plant, at Canton, Ohio; the New Columbus (Ohio) plant, and the Youngstown Bridge Company's works, Youngstown, Ohio.

The Market for Gas Securities.

The market for city gas shares during the week was strong, with considerable volume in the trading. To day (Friday) the Exchange is closed. The quotation for Consolidated at the end of the trading Thursday afternoon was 215¾ to 216. No development of importance was made during the week, although the engineering staff of the Consolidated Company have determined to make an important addition to the generating plant at the Ravens wood station. This would seem to verify the statement heretofore made that the Manhattan station, west, will partly at least have to make way for the public docks' improvement at that point.

Brooklyn Union is strong, at 206 to 209, and Baltimore Consolidated is 60½ to 60⅝. Peoples of Chicago, moved up rapidly last week. It closed at 111⅜ to 111½, and every fair indication points to higher prices for it. Lacledes, both common and preferred, are notably higher. The Indianapolis group continues weak, especially in respect of the various bond issues. A sharp advance has been made in the shares of the New Orleans (La.) Company.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

APRIL 8.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	215¾	216
Central Union, Bonds, 5's	3,000,000	1,000	108½	109½
Equitable Bonds, 6's	1,000,000	1,000	105	..
" 1st Con. 5's	2,300,000	1,000	120	
Metropolitan Bonds	658,000	.	108	112
Mutual	3,500,000	100	294	298
" Bonds	1,500,000	1,000	100	102
Municipal Bonds	750,000	.	..	
New Amsterdam Gas Co..				
Bonds, 5's	11,000,000	1,000	109	110
Northern Union, Bonds, 5's.	1,250,000	1,000	104	104¼
New York and East River .				
Bonds 1st 5's	3,500,000	1,000	103	106⅜
" 1st Con. 5's	1,500,000		115	.
Richmond Co., S. I.	348,650	50	70	..
" Bonds	100,000	1,000	..	..
Standard	5,000,000	100	132	..
Preferred	5,000,000	100	152	160
Bonds, 1st Mortgage, 5's	1,500,000	1,000	110	114
Yonkers	299,600	500	130	
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	206	210
" " Bonds (5's)	15 000,000	1,000	118	119
Bay State	50,000,000	50	1	1⅛
" Income Bonds	2,000,000	1,000	..	75
Binghamton Gas Works..	450,000	100	25	30
" 1st Mtg. 5's	503,000	1,000	96½	99½
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	12	13
" " Bonds, 5's	5,250,000	1,000	98	100
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000		
Central San Francisco	2,000,000	..	106	108
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	104¼
Cincinnati G. & C. Co.	8,500,000	100	199	199½
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	106	107
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	60	65
Preferred	3,026,500	100	84	86
Consumers, Jersey City Bonds	600,000	1,000	102	103
Consumers, Toronto	1,700,000	50	215	216
Consolidated, Baltimore	11,000,000	100	60¼	60⅝
Mortgage, 6's	3,600,000	..	..	118
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	112
Consolidated Gas Co. of N.J.	1,000,000	100	13	16
" Con. Mtg. 5's	380,000	1,000	80	85
Consolidated G. & E. Co.'s., Little Falls, N.Y.	90,000	100	..	100
Bonds	75,000	..	..	100
Detroit City Gas Co.	4,560,000	50	88	89
" Prior Lien 5's	4,737,000	1,000	99½	100
Detroit Gas Co., 5's	381,000	1,000	..	89
" Inc. 5's	16,000	100	94	94½
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	35	40
Fort Wayne	2,000,000	..	35	41
" Bonds	2,000,000	..	55	..
Grand Rapids Gas Lt. Co..	1,000,000	50	103	105
" 1st Mtg. 5's	1,225,000	1,000	.	.
Hartford	750,000	25	240	250
Hudson County Gas Co., of New Jersey	10,500,000	..	25	..
" Bonds, 5's	10,500,000	..	101	103
Indianapolis	2,000,000	..	48	53
" Bonds, 6's	2 650,000	..	94⅞	98
Jackson Gas Co.	250,000	50	70	75
" 1st Mtg. 5's	265,000	1,000	101	102½
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	36
Bonds, 1st 5's	3,822,000	1,000	101½	103
Laclede, St. Louis	8,271,900	100	84¾	85
Preferred	2,500,000	100	98	100½
Bonds	10,000,000	1,000	108½	109
Lafayette Gas Co., Ind.	1,000,000	100	55	60
Bonds	1,000,000	1,000	56	59
Louisville	2,570,000	50	110	120
Madison Gas & Elec. Co.	400,000	100	64	67
" 1st Mtg. 6's	350,000	1,000	102½	108
" 6 per cent. scrip, due 1910	100,000	25	87	89
Montreal, Canada	2,000,000	100	182	184¾
Newark, N. J., Con. Gas Co	6,000,000	..	..	55
Bonds, 6's	4,600,000		..	103
New Haven	1,000,000	25	280	300
Nashville Gas Lt. Co.	1,000,000	50	110	..
Oakland, Cal.	2,000,000	..	46	47
" Bonds	750,000	..	..	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	111⅛	11 ½
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	..	..
2d "	2,500,000	1,000	104	
Rochester Gas & Elec. Co..	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	87½	90
San Francisco, Cal.	10,000,000	100	47¼	47½
St. Paul Gas Light Co.	1,500,000	100	45	47
1st Mortgage 6's	650,000	1,000	82	85
Extension, 6's	600,000	1,000	..	..
General Mortgage, 5's	2,465,000	1,000	88	0⅛
St. Joseph Gas Co.	1,000,000	100	36	39
" 1st Mtg. 5's	750,000	1,000	96½	98
Syracuse, N. Y.	1,750,000	100	18	19
Bonds	1,612 000	1,000	83½	93
Washington, D. C	2,600,000	20	307½	314½
First mortgage 6's	660,000		.	..
Western, Milwaukee	4,000,000	100	93¾	95
Bonds, 5's	3,830,500	..	106½	107½
Wilmington, Del.	600,000	50	200	201

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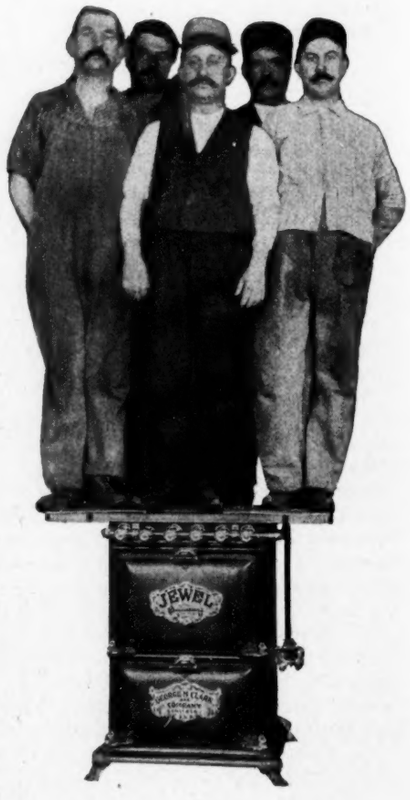

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DIVIDEND NOTICE.

OFFICE OF THE UNITED GAS IMPROVEMENT CO., N. W. CORNER BROAD AND ARCH STS., PHILA., PA., Mar 13, 1901.

The Directors have this day declared a quarterly dividend of 2 per cent. (one dollar per share), payable April 15th, 1901, to stockholders of record at the close of business, Mar. 30. Checks will be mailed.

1345-4 LEWIS LILLIE, Treasurer.

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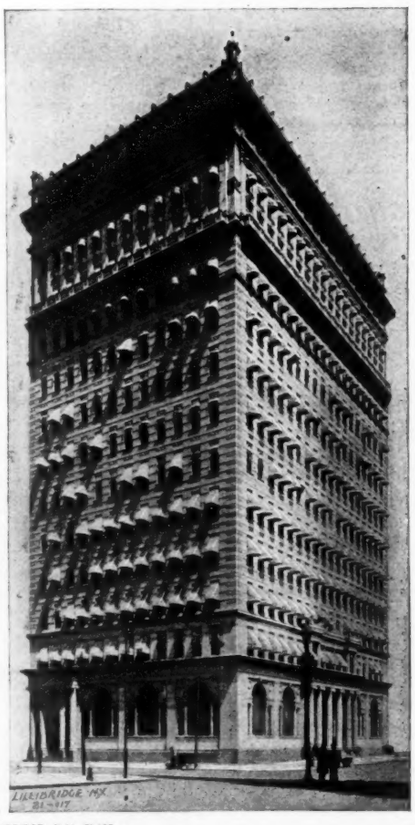

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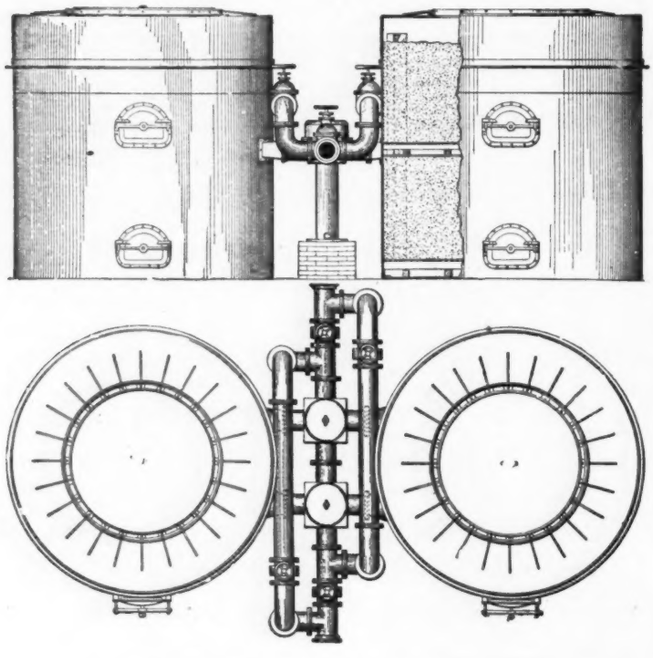

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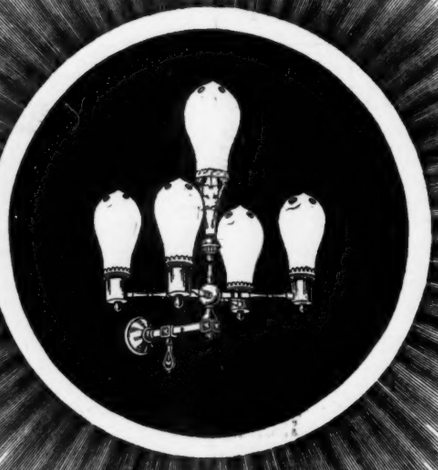

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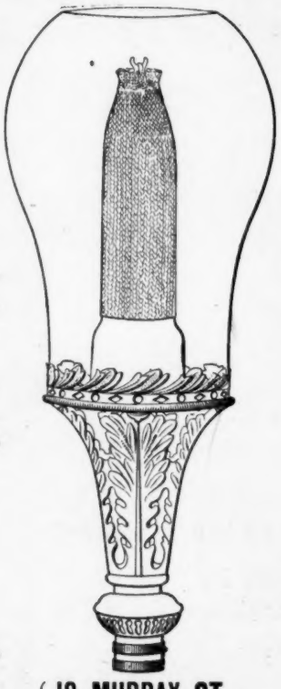
"	3	"	3	"	105	"
"	4	"	4	"	140	"
"	7	"	7	"	225	"



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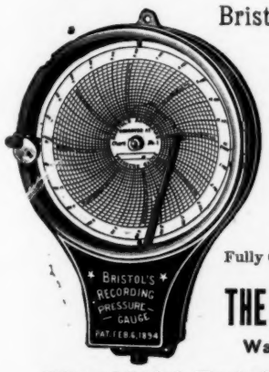

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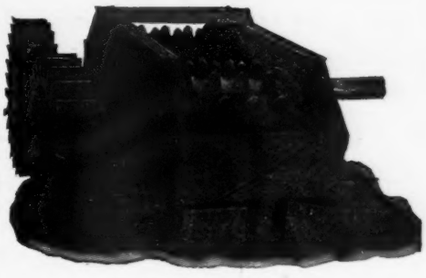

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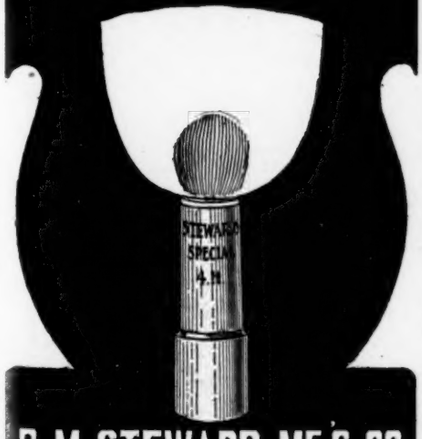

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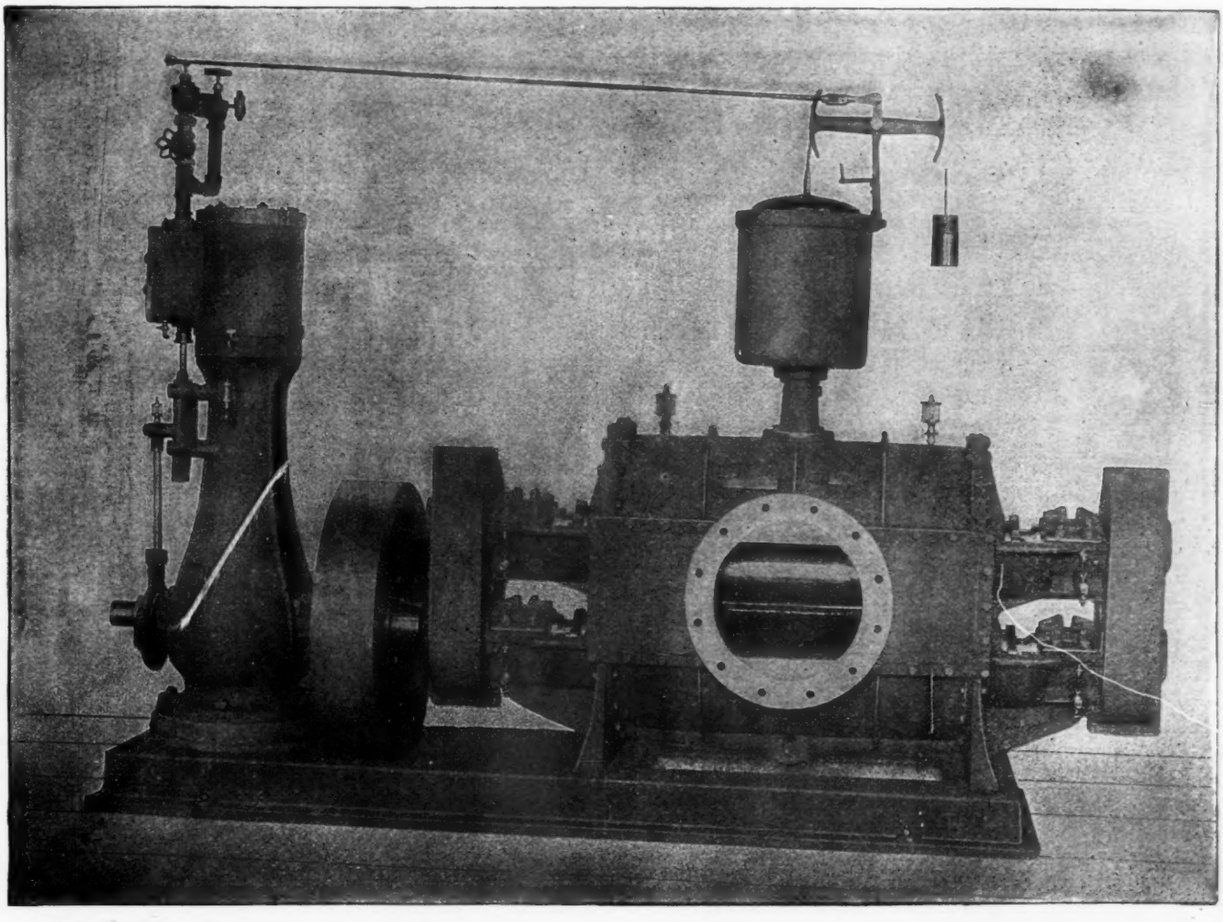

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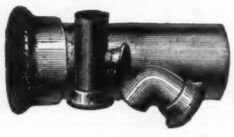

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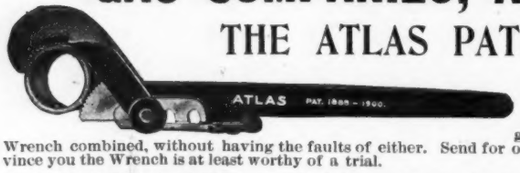

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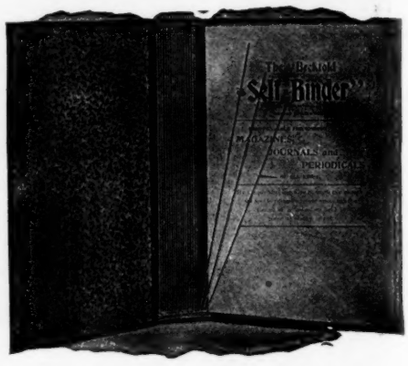

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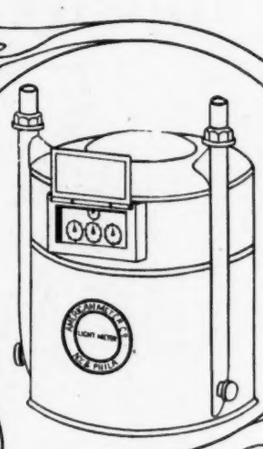

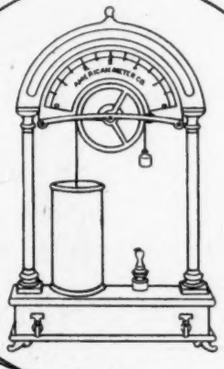

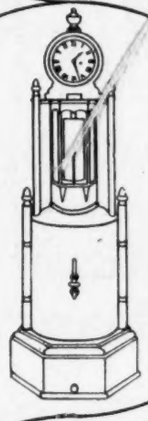

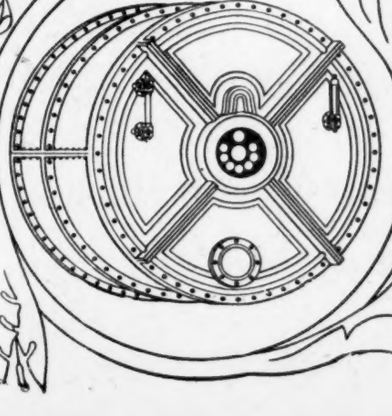

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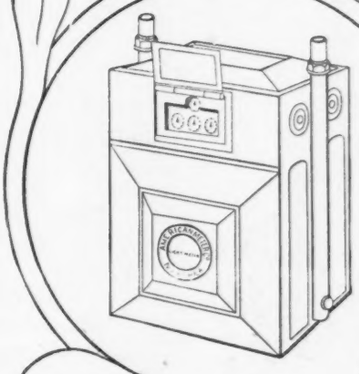
PUBLIC LIGHTING TABLE.

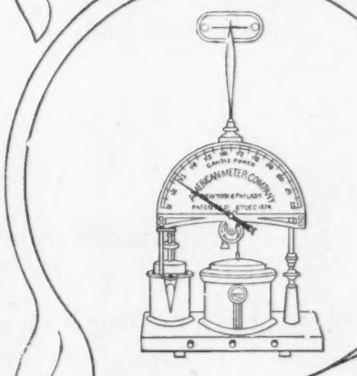
APRIL, 1901.

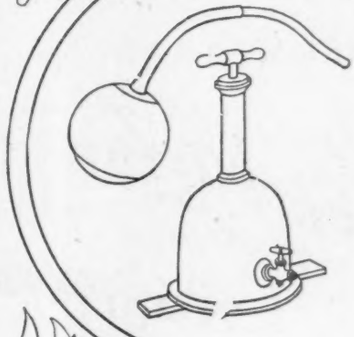
Day of Week.	Date.	Table No. 1. Following the Moon. Light.	Table No. 1. Following the Moon. Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Table No. 2. New York City. All Night Lighting. Extinguish.
				P.M.	A.M.
Mon.	1	3.40 AM	4.50 AM	6.10	4.55
Tue.	2	No L.	No L.	6.15	4.40
Wed.	3	No L. FM	No L.	6.15	4.40
Thu.	4	No L.	No L.	6.15	4.40
Fri.	5	7.00 PM	9.10 PM	6.15	4.40
Sat.	6	7.00	10.10	6.15	4.40
Sun.	7	7.00	11.10	6.15	4.40
Mon.	8	7.00	12.00	6.15	4.40
Tue.	9	7.00	12.50 AM	6.25	4.30
Wed.	10	7.00	1.30	6.25	4.30
Thu.	11	7.00 LQ	2.20	6.25	4.30
Fri.	12	7.00	2.50	6.25	4.30
Sat.	13	7.00	3.30	6.25	4.30
Sun.	14	7.10	4.00	6.25	4.30
Mon.	15	7.10	4.20	6.25	4.30
Tue.	16	7.10	4.20	6.30	4.20
Wed.	17	7.10	4.20	6.30	4.20
Thu.	18	7.10 NM	4.20	6.30	4.20
Fri.	19	7.10	4.20	6.30	4.20
Sat.	20	7.10	4.20	6.30	4.20
Sun.	21	7.10	4.10	6.30	4.20
Mon.	22	7.10	4.10	6.30	4.20
Tue.	23	11.00	4.10	6.40	4.10
Wed.	24	11.40	4.10	6.40	4.10
Thu.	25	12.20 AM PQ	4.10	6.40	4.10
Fri.	26	12.50	4.10	6.40	4.10
Sat.	27	1.20	4.10	6.40	4.10
Sun.	28	1.50	4.00	6.40	4.10
Mon.	29	2.10	4.00	6.40	4.10
Tue.	30	2.40	4.00	6.45	4.00

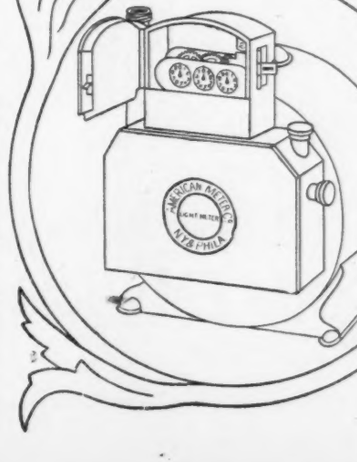
TOTAL HOURS LIGHTING DURING 1901.

By Table No. 1.	Hrs.Min.	By Table No. 2.	Hrs.Min.
January	220.10	January	423.20
February	192.30	February	355.25
March	180.00	March	355.35
April	158.30	April	298.50
May	140.40	May	264.50
June	135.40	June	234.25
July	138.00	July	243.45
August	156.20	August	280.25
September	174.40	September	321.15
October	202.30	October	374.30
November	220.40	November	401.40
December	241.30	December	433.45
Total, yr.	2161.10	Total, yr.	3987.45









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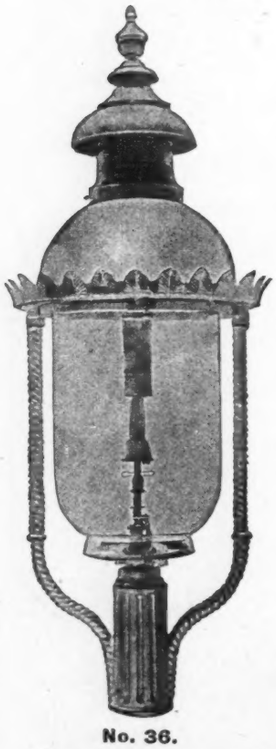

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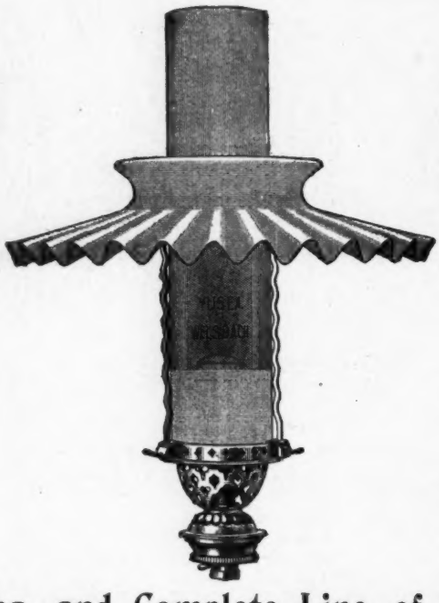

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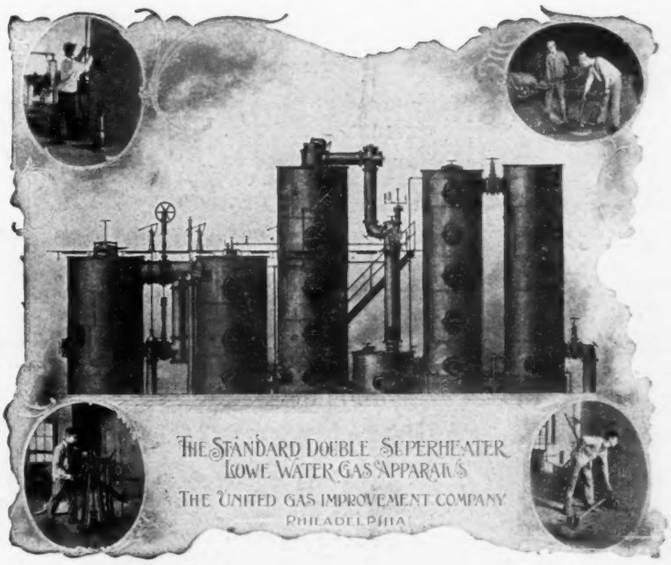
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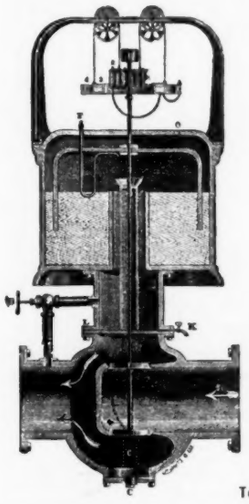

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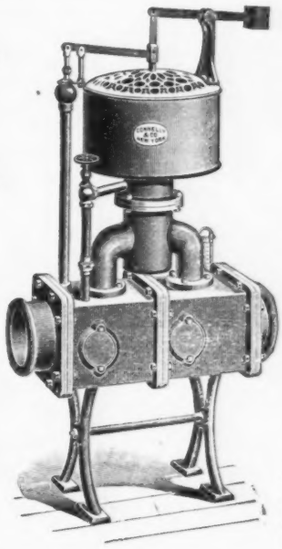

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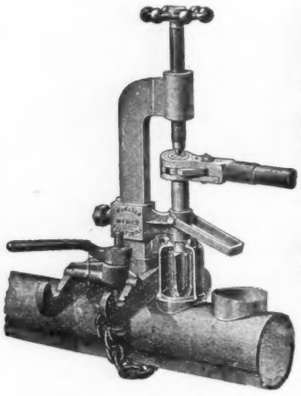

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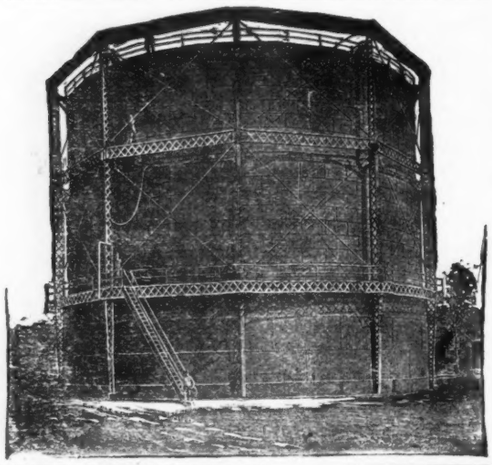

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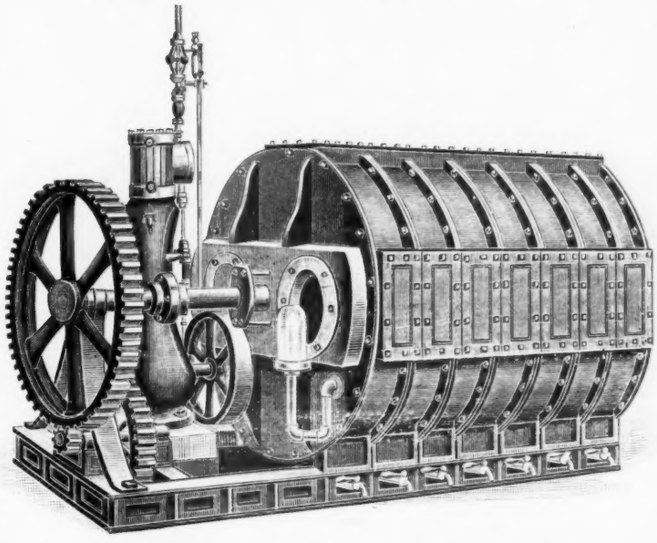

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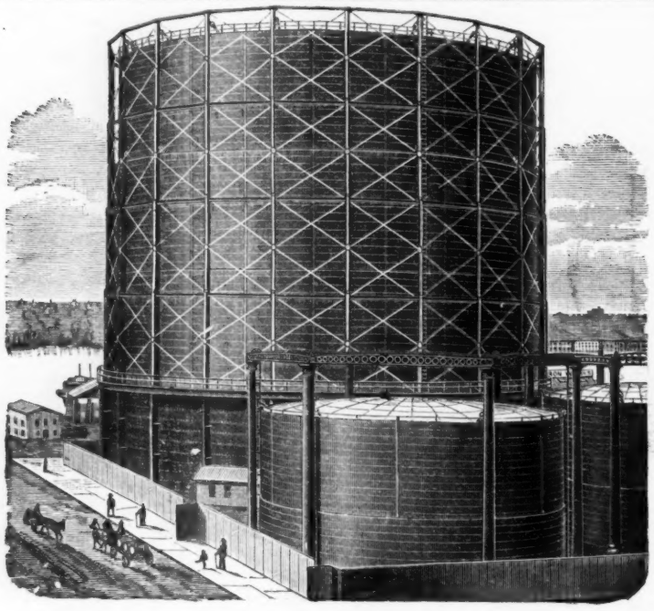

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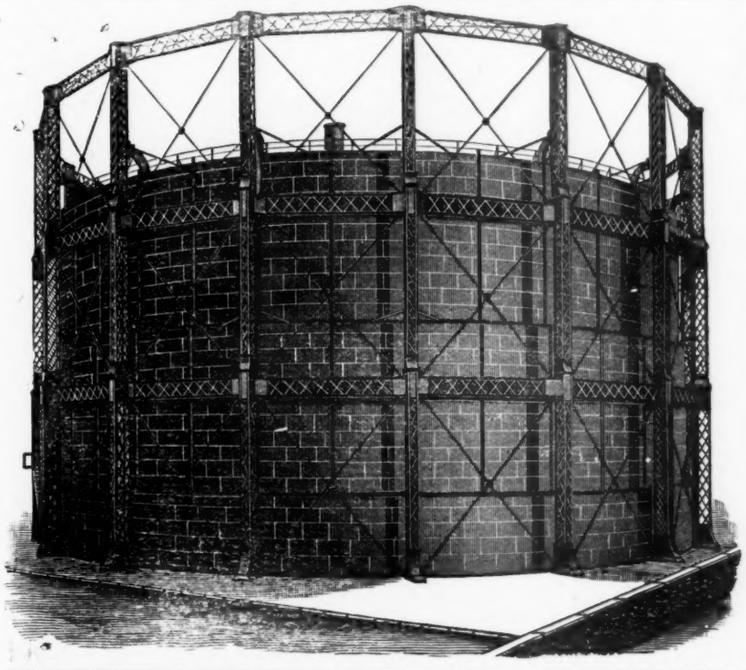

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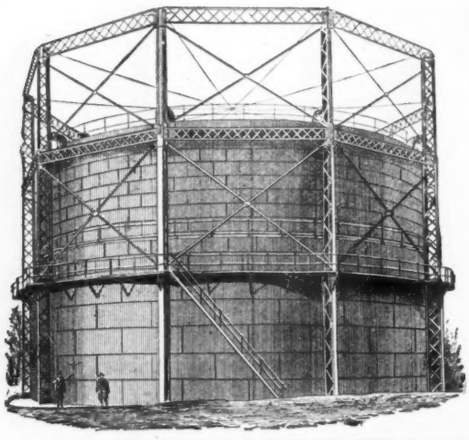

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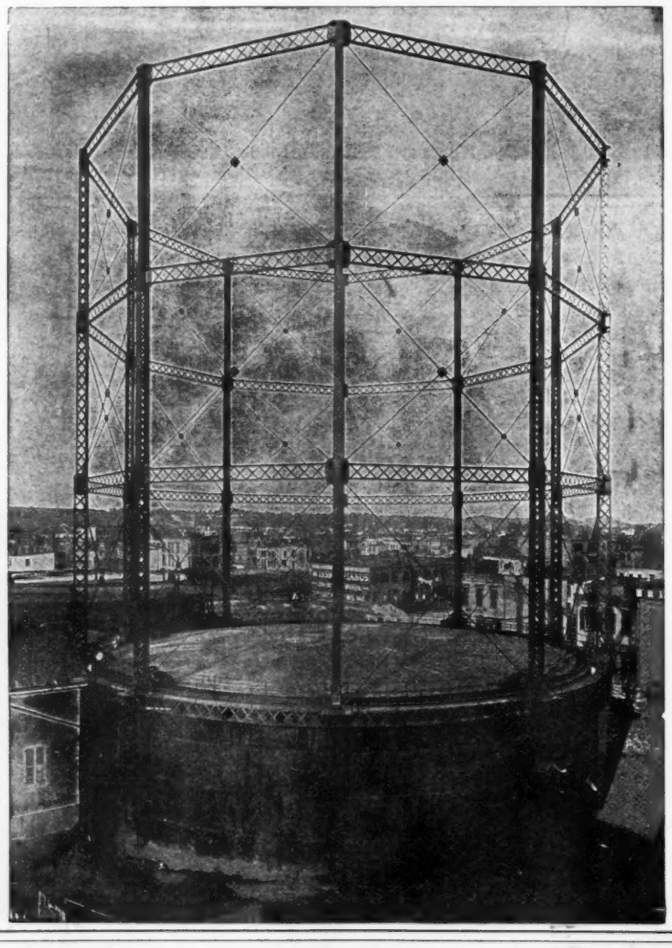

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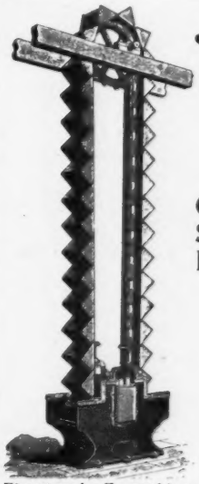

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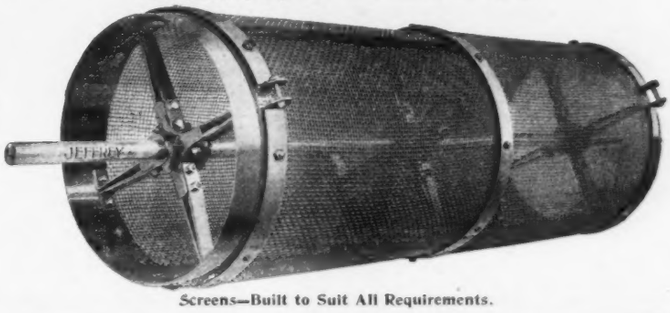

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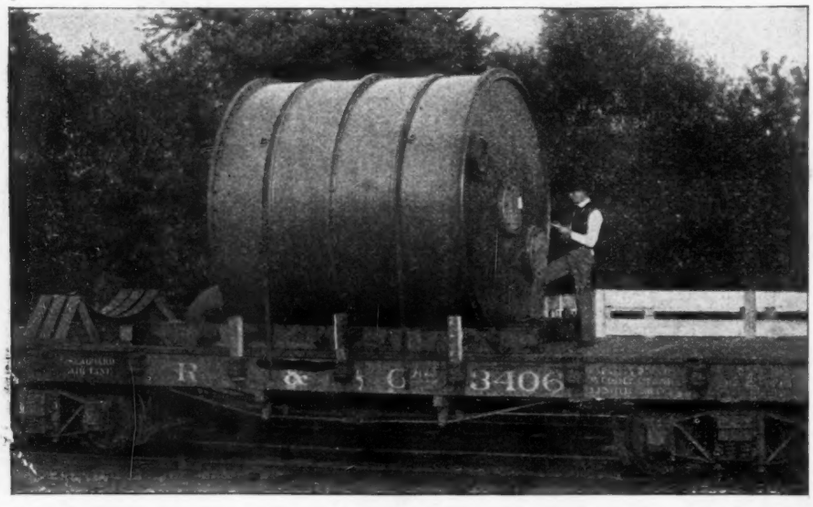

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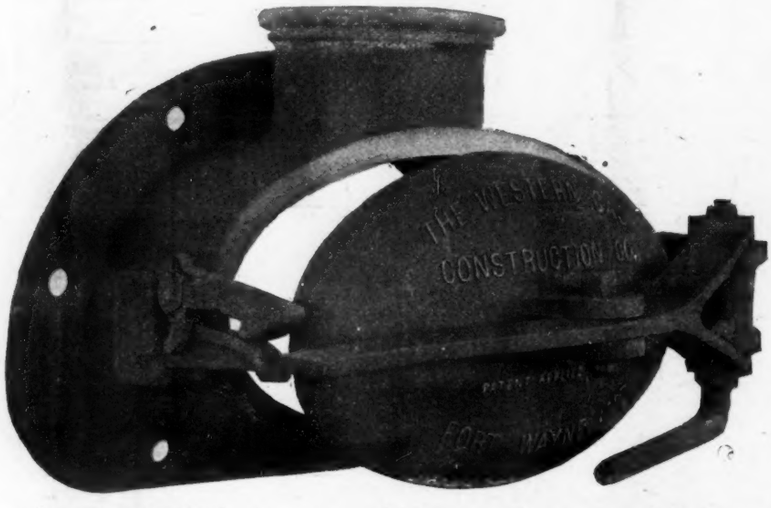

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